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CHRIS IRVING, DENVER, COLO.

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English Prize Essay on "Iron Drains and Their Fittings"

By W. H. Thurston, Associate, Royal Sanitary Institute

Drains are the means by which anything is drained; that is, a channel through which water or other liquids flow off.

Iron drains are at the present time coming into great prominence in the sanitary world, and it may be interesting to enquire into the causes of this fact. The health of the population depends so largely on efficient sanitation that any new departure in drainage methods should be most carefully considered.

Iron drains are used principally as underground drains from buildings, or for conducting waste liquids and foul matters from the bottoms of upright pipes or stacks (the drain being sometimes carried across a basement supported

Fig. 1.

on iron straps, piers or bolts, from floors or joists above) to the sewer in the roadway.

Within the term "drains" would be included the drainage system so far as it is in the curtilage of the building or buildings, before it enters the sewer in the roadway; or in systems of drainage for country buildings in which the sewage disposal is carried out on their own grounds, or to the septic tank, cesspool, or similar reservoir.

Iron drains are constructed of cast-iron, properly protected by some coating, and should be similar to those used by the Water and Gas Companies for their mains.

Iron is the most common and useful of the metals, and is known in various forms; namely, wrought-iron, cast-iron, and steel. Cast-iron is most generally used for drains, and it is a compound of carbon and iron obtained directly from iron ore by smelting.

By fittings are meant anything used in connecting up the drains.

In the manufacture of iron drain pipes they are cast in sand moulds, and are best cast in an upright position with the socket or enlarged end downwards. This strengthens the socket by reason of the pressure exerted by the head of liquid iron. The piping is generally cast in 9 ft. lengths.

Chambers, traps, gullies, bends and other fittings are also cast in sand molds.

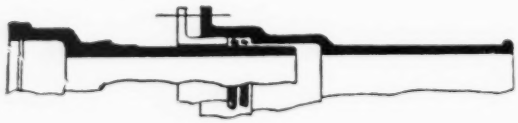

Fig. 2.

The actions and forces which have to be considered in designing iron drains are:

(I.) Corrosion or eating away.

(II.) The settlement or vibration of the land or building in which they are laid or fixed.

(III.) The expansion and contraction of the iron due to change in temperature.

(IV.) Atmospheric influences.

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(I.) *Corrosion or eating away* is due to the liquids passing through the drains as well as the action of moist earths outside.

Cast-iron by itself would soon be acted upon, so that a protective coating must be applied to such drain pipes and fittings, the most commonly used being Dr. Angus Smith's

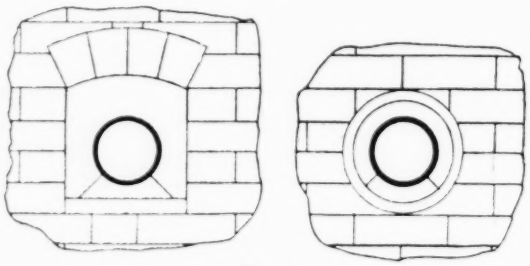


Fig. 3.

solution. The process consists of dipping the pipes and fittings at a high temperature into this solution, which is a mixture of coal-tar, pitch, and resin. After the pipes are taken out of the solution they are allowed to drain and the coating to dry.

With enameled pipes, a vitreous enamel, similar to that applied to cast-iron baths, is now burnt on the inside of the drain pipes, and is a very good protective coating.

The drain pipes could be lead-lined, thereby combining the strength of cast-iron with the smoothness of lead (see

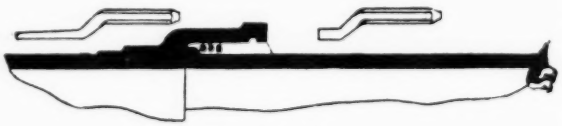


Fig. 4

Fig. 1); but this kind of pipe, although tried, has not been a success.

Glass-lined iron pipes, in which there is a soft packing between the glass lining and the iron pipe, have also been used. The packing generally used is asbestos.

Iron pipes could be oxidized, limewashed, or painted, so as to give a protective coating to them.

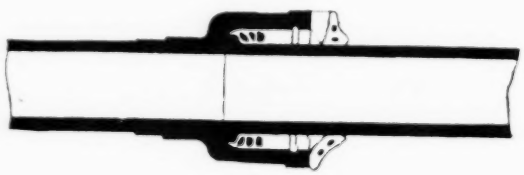


Fig. 5.

In either the lined or the coated iron drain pipes and fittings a great difficulty to be overcome is the unequal expansion of the cast-iron and the protective coating or lining, which would cause the coating or lining to crack or break. The lining or coating should therefore have a co-efficient of expansion equal to that of cast-iron.

Vitreous enameled pipes seem to stand the action of heat, because the enamel expands and contracts in about the same

proportion as the cast-iron. (See III. as to expansion of the iron pipe as separate from the lining.)

(II.) *Settlement or vibration.*—Iron drain pipes should be supported upon the best and most rigid positions clear of the foundations and walls.

In the L. C. C. Regulations, which may be taken as embracing the most serviceable methods, the strength and size of cast-iron drain pipes are as in the following table:

Table I.

Internal diameter in inches.	Thickness of metal (not less than) in inches.	Weight per 9 ft. length (including socket and spigot or flanges, the socket not to be less than $\frac{3}{8}$ in. thick) not less than
3	$\frac{1}{2}$	110 lbs.
4	$\frac{3}{8}$	160 lbs.
5	$\frac{3}{8}$	190 lbs.
6	$\frac{3}{8}$	230 lbs.

These drains would have to be laid on a bed of concrete if underground, and laid on concrete and covered with the same material if passing under a building; but if they are accessible all around they can be carried on piers or supports constructed of iron, concrete, stone or brick at each joint.

If the drain passes through or beneath a wall the drain should be clear of the walls and protected from any settlement or vibration of wall by means of an arch, iron support, or flagstone (see Fig. 3).

(III.) *Expansion and contraction, etc.*—By not fixing the drain pipes too rigid, special provisions for expansion are not necessary, because any slight expansion is taken up in the joints, the spigot of each pipe sliding through the caulked collar of the lead which forms the joint.

If the drains are exposed, as with "hung drains," where practicable provision for expansion could be made by means of bends, as in heating work. Fig. 2 shows an expansion-joint which might be used on iron drains.

The expansion of cast-iron is .0000061 for 1 deg. Fahr., or a total when heated from 32 degs. Fahr. to 212 degs. Fahr. of .0011, or 1 in 909.

This expansion must be allowed for when passing through walls by either passing through an iron collar or an arched opening (see Fig. 3). When iron drains are covered with concrete or earth the expansion of the iron is kept more uniform, because the heat is conducted away by the surrounding colder earth or concrete.

Inside the drain the passing liquids vary very much in

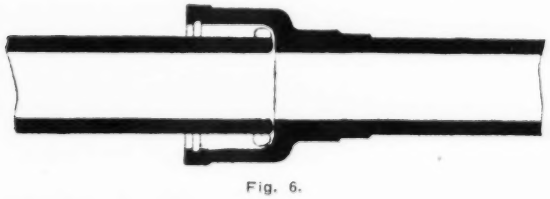


Fig. 6.

temperature. For example, when a bath of hot water has been discharged, the increase in temperature of the drain pipe would cause expansion, and then a body of cold water passing through would cause contraction.

(IV.) *Atmospheric influences.*—When laid underground, atmospheric influences will have very little effect, though some moist earth would cause corrosion of the drain pipes; but when in exposed positions, as when crossing open areas or suspended beneath ceilings, some provision should be made for the expansion and contraction due to the changes of temperature of the surrounding atmosphere; for there may be either a freezing temperature or a hot sun heat on a pipe in an open area, or hot air or steam when the pipe is passing through or along the ceiling of a room in the basement. This is an external force and can be allowed for, but, on the whole, atmospheric influences, so far as they relate to drains,

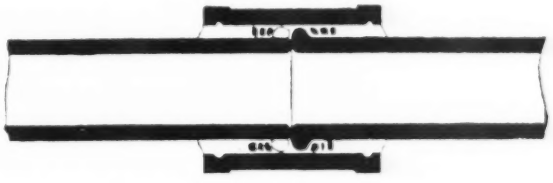


Fig. 6a.

are not of so much importance as to be worth considering.

The discharge of a drain depends upon the fall given: too slight a fall gives a sluggish flow, too steep a fall causes a sharp flow, and any solid matters that are mixed with the liquid are left behind and drag on the invert of the pipe. A medium fall is necessary to carry away as quickly as possible all liquid and solid matters together, the solid matter being suspended or floated in the liquid.

A suitable velocity is considered to be about 4½ feet per second, and the following table shows how this velocity can be obtained:

Table II.

Diameter of pipe in inches.	Fall.
4	1 in 40
5	1 in 50
6	1 in 60
9	1 in 90

The rule is to multiply the diameter of the drain in inches by 10 and the fall is 1 in that product. This gives the falls shown in the table.

The L. C. C. Drainage by-laws state that the minimum internal diameter for drains conveying sewage shall be 4 in.

Sockets for caulking iron drains are not to be less than 2½ in. in depth, and an annular space for lead not less than

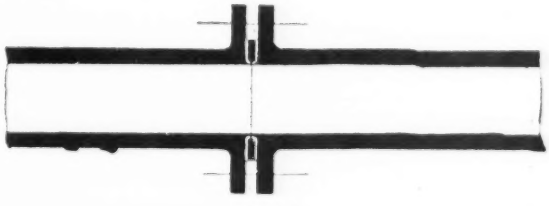


Fig. 7.

¼ in. in width. The depth and width increases with the enlarged size of the drain; thus, for 6 in. pipes not less than ⅜ in. in width for the lead packing is required.

Flange joints can be used, and they are bolted together with some suitable packing between the flanges.

The drain should be constructed so as to be watertight and stand a pressure of at least 2 ft. head of water.

Adequate means of access should be made wherever practicable, and when the drain passes under buildings access should be made outside each face of the building.

All inlets to drains should be trapped except where outlets and inlets for ventilation are made.

Drains should be intercepted or disconnected from the sewer, cesspool, or septic tank.

A trap, termed an intercepting trap, is to be fixed on the drain at a convenient point before it enters the sewer, and

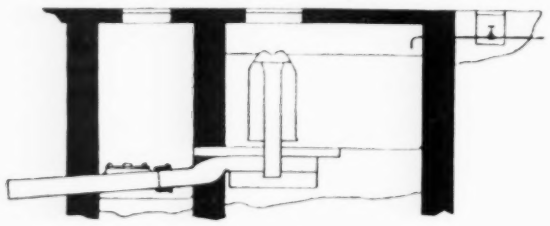


Fig. 8.

should be within the curtilage of the building or drainage scheme.

It is also required that a drain shall be laid on a bed of concrete not less than 6 in. thick, and projecting on each side to the extent at least equal to the external diameter of the drain.

The pipes should be laid with a true invert and in a straight line, inspection holes being provided at all junctions, bends, and special fittings.

The cubic capacity of drains ought to be kept as small as possible, or in other words they should not be of a greater diameter than is actually necessary. Dead ends in inspection chambers should be avoided. When designing a drainage scheme, arrangements should be made for the greatest flow of liquid to enter at the head of the drain or into a chamber, so as to flush any backwash from the branches into the chamber.

An automatic flushing tank is advisable at the head of a

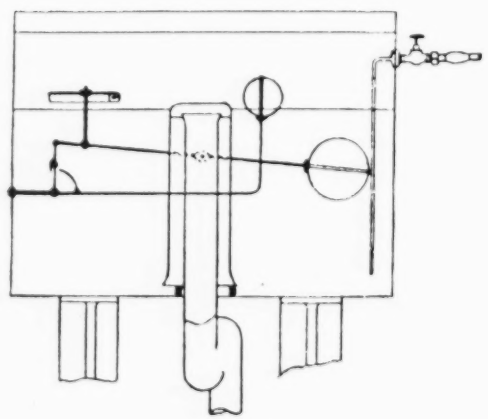


Fig. 9

drain, or a bath waste-pipe where practicable should be used for a similar purpose.

Grease should either be passed through the drains in lumps or be intercepted from the drains.

Joints and Methods of Making.

The chief kinds are (1) caulked joints, that is molten lead run, lead rope, lead wool, or ribbonite (a kind of small lead ribbon); (2) flange joints; (3) rust joints; (4) expansion joints; (5) Portland cement joints.

There should be annular grooves inside the sockets of iron drain-pipes so as to form keys to hold the jointing material, when set, in its position. Preparatory to jointing them, the pipes are placed in position with the spigot end in the socket, as shown in Fig. 4, in which is also depicted a yarning and a caulking tool for making joints. The yarning material is usually gaskin or yarn, but lead wool, or some material

Fig. 10.

that will not decompose, is better. Two to four strands of the yarning material are first inserted, and which should then be caulked home tight, otherwise the molten lead is liable to run through into the inside of the pipe.

The rest of the joint is filled up by pouring molten lead into the top side, a clay collar having previously been placed

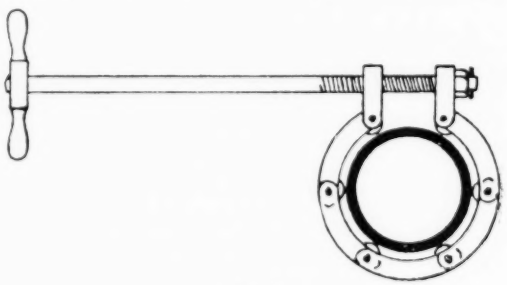


Fig. 11.

around the joint. The clay could be strengthened by passing some pieces of yarn or rope through it. After the joint has been run the clay is removed and the lead caulked home tight into the joint. (See Fig. 5.)

When using cut lengths it is advisable to fix a shoulder or ring of iron on the spigot ends so as to ensure the bore

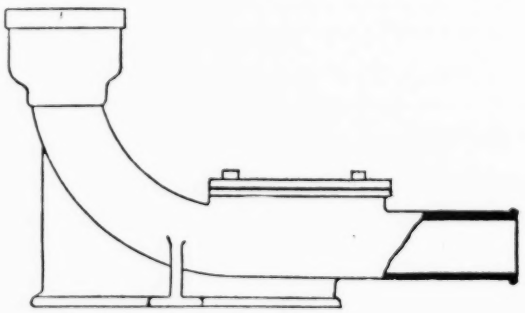


Fig. 12.

of the drain being kept true and the joint concentric. The shoulders could be wrought-iron rings shrunk on (see Fig. 6). In the absence of such a ring the yarning material only is relied upon, but the joint cannot be reliably caulked, because the yarning material might be forced into the bore of the drain.

In jointing short lengths together a slip socket or collar could be used (see Fig. 6A).

Lead Rope, Lead Wool, and Ribbonite.—The joint is prepared in the same manner as the yarned joint, but instead of using yarn and lead, the above forms of lead are used by caulking in newly cut strands of lead (which should not be oxidized) until the joint is full. This caulking forces the strands of lead together so that they combine into a solid mass of lead. If properly done this is the more reliable joint, as the lead is denser in the center; and this increases the strength of the joint, because it is firmly caulked to the whole depth of the socket instead of on the exposed surface only.

These kinds of lead for caulking are very useful when repairing and making alterations, because a little dampness or water in the joint need not be taken into account; whereas when running molten lead into damp or wet joints it is liable to cause injury to the workman.

Flange Joints, bolted together, with an imperishable packing between the flanges, form the best kind of joint where there is a probability of future alterations, or when fitting a pipe which may have to be renewed at any time. Insertion, millboard or rubber packing is generally used, and it must be bolted up so as to make a gas and water tight joint.

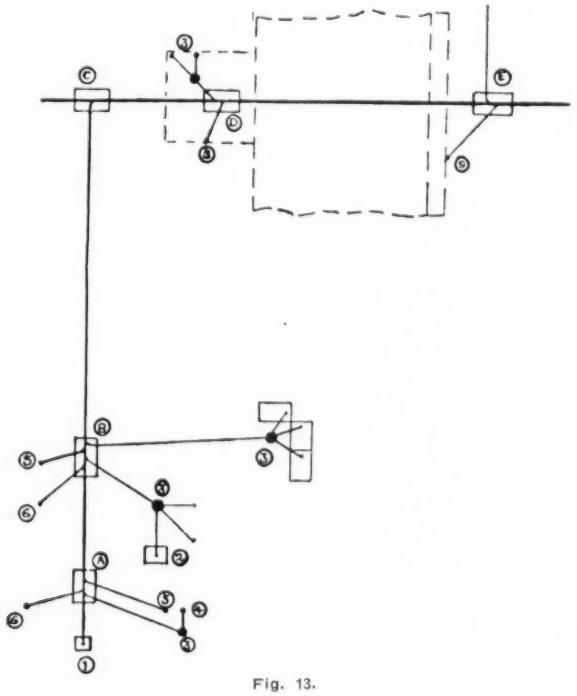


Fig. 13.

A Rust Joint for joining pipes or fittings together is made by filling the joints with iron borings and other substances that will act on the iron, and cause the borings, the inside of the socket and the outside of the spigot of the pipe to rust together. The great drawback is that in setting the rust cement is liable to burst the sacket; hence it should be "slow" in distinction to "quick" setting.

Rust joints are not so good as caulked lead joints. In rust joints, the inside of the socket and outside of the spigot must be cleaned from all protective coating so as to be acted upon by the rust or oxidizing material.

Expansion Joints are necessary in places exposed to view, and where the drain pipe is liable to be affected by changes of temperature (see Fig. 2). The glands of such joints should be secured with nuts and bolts on to a suitable packing material.

Portland Cement Joints last fairly well, but are not as good as caulked or flange joints, because the cement is likely to crumble away or be cracked by the unequal expansion that takes place. In cases where the yarn or gaskin forms the joint, the Portland cement forms a facing to keep such yarn in its place or position.

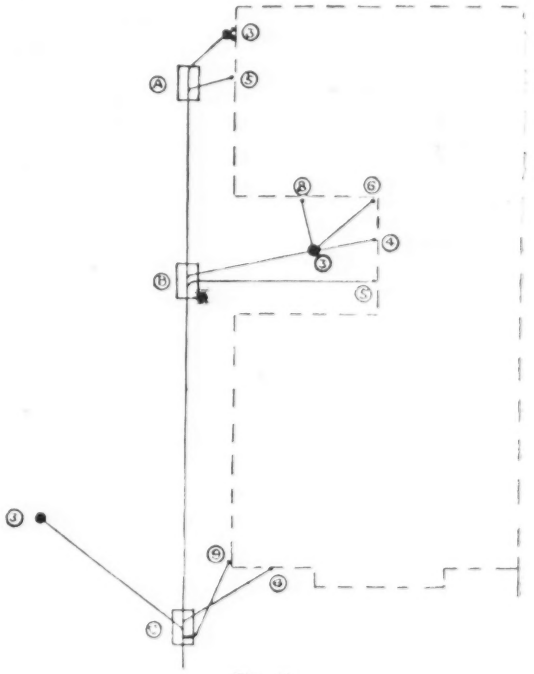


Fig. 14.

VENTILATION OF DRAINS, OR AIR FLUSHING.

The air in drains should never be stagnant, but always kept on the move by providing them with inlet and outlet shafts of the same diameter as the drain. Such shafts should be taken from the top of the inlet of the interceptor trap and the highest part of the drain respectively, and carried to a safe height above all windows and surrounding openings. This arrangement would allow the air currents to pass in either direction. On some works a mica flap-valve (termed a fresh-air inlet) is fixed to the interceptor, and a soil-pipe with ventilation-pipe continued from the top end of the drain

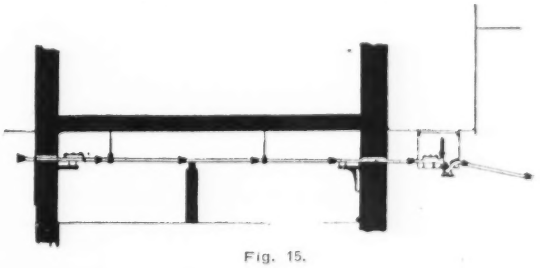


Fig. 15.

as an outlet. Mica flap-valve fresh-air inlets are, however, liable to get out of order, and they allow the air flush to pass only in one direction.

Drains should be water flushed—that is, a quantity of water be passed quickly through so as to scour and cleanse the drains. Fig. 8 shows a form of automatic flushing tank to be fixed on the same level as the drains. Fig. 9 shows another form of flushing tank to be fixed above ground with a 6 ft. to 8 ft. head of flush. This latter form of automatic

acting flushing tank could be used in conjunction with a flush-out grease trap.

Inspection Covers to all cast-iron fittings and pipes should be so constructed as to form the exact bore of the drain-pipe, and thus reduce the fouling surface as much as possible.

Access Manholes to iron drain inspection covers have an ordinary cover, as in Fig. 10. This cover is bedded down

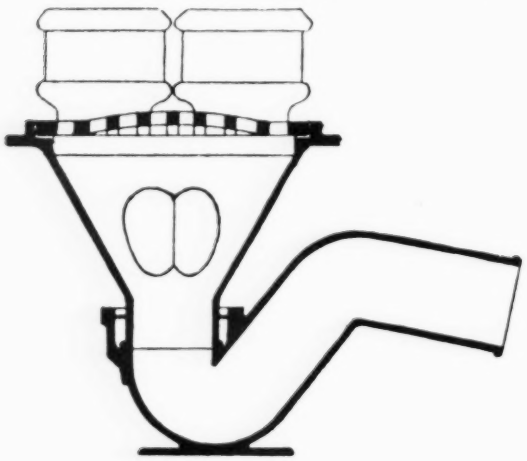


Fig. 16.

with some plastic substance, generally Housen's cement mixed with oil, at the ground or floor level, and so fixed as to give access to the inspection cover fixed on the drain.

In cutting iron drain-pipes, Fig. 11 shows the best appliance or pipe-cutter; although a hammer and a diamond point chisel are generally used.

When making a connection to a sewer, septic tank, or cesspool, a disconnecting trap is provided so as to intercept any gases that might generate from passing into the drain.

In low-lying districts the liability of a backwash has to be

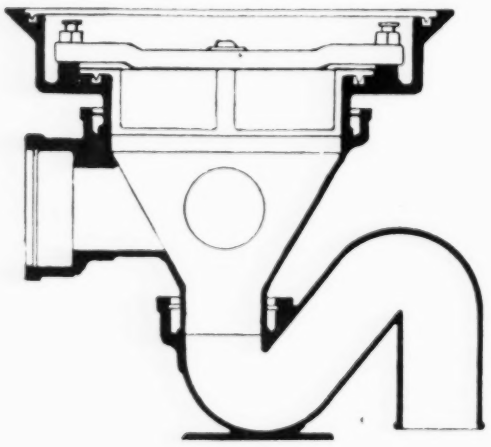


Fig. 17.

overcome; that is, the sewage must not be allowed to flow back into the house drains. A flap-valve is therefore fixed on the drain as it enters the sewer, etc., or a ball backwash fitting is fixed in an accessible position in or next to the disconnecting trap.

The bottom ends of stacks of pipes should have flanged bends and supports to take the weight of the pipes and also that of falling matters passing into the bends (see Fig. 12).

In describing the fittings and their application, two sketch plans are herewith shown: One being a portion of the drains of a London club house (Fig. 13), and the other a residential house (Fig. 14).

In quantity surveying it is usual to begin with the gully at the point of the drain farthest from the outfall; number and describe it; then take the drain therefrom to the first chamber.

Next take the fittings and drains that go into this pipe and chamber, and then the chamber. Next take the pipe from this chamber into the next, and all its branches with their fittings, and so on. Finally the pipe from the last chamber to the sewer in the roadway and connection therewith.

Reference numbers on Figs. 13 and 14: 1, flushing tank; 2, flushing tank; 3, gully trap; 4, bath and lavatory waste; 5, soil and ventilation pipe; 6, rainwater pipe; 7, a grease trap; 8, sink waste; 9, ventilating pipe, or F. A. I.

In Fig. 13, 1 is the flushing tank at the head of drain, as shown by Fig. 8; 3 is a gully in the yard and is as shown in Fig. 16, with a bath and lavatory waste pipe coming into the same; 6 is a closed gully, as Fig. 17, taking a rainwater pipe which is inside part of the kitchen; 5 is a soil and ventilation pipe passing straight through into the inspection-hole, A; with a bend at the foot of the stack, as shown by Fig. 12.

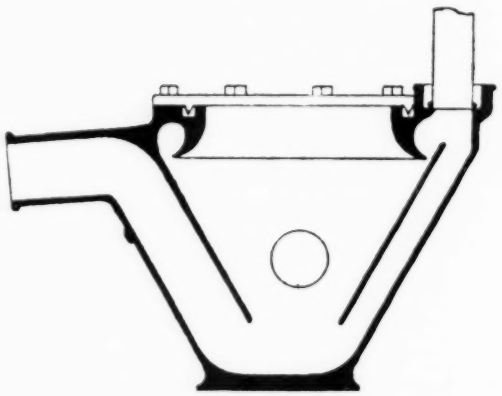


Fig. 18.

A is the first inspection chamber or manhole at the head of the drains. Manhole B is a chamber with a bolted-down cover, as Fig. 19, and receives a soil and ventilation branch drain and three gully drains; 2 is an automatic flushing tank, as Fig. 9, for flushing the grease trap, Fig. 18, which takes the waste from two sinks.

Gully 3, into chamber B, receives the waste water from three wash-up sinks. Chamber C is where the kitchen drain connects into the main drain.

Chamber D is in an open area with soil-pipe (5) carried into it, and also an open gully, as Fig. 16, which takes a lavatory waste and a rainwater pipe.

The disconnecting chamber is shown at E; the drain pipe from chamber D passes through a cellar and is hung from the floor above, or on brackets from the wall, or piers built up to the drain pipe from the floor. Fig. 15 shows this portion in sectional elevation.

The chamber E, shown as Fig. 20, receives a branch drain from other drains, and has a fresh-air inlet pipe taken from the top next to the inspection hole.

In Fig. 14, 3 at top of chamber A is a gully (Fig. 16), and receives bath and lavatory waste, also a sink waste; 5 is a soil and ventilating pipe. Chamber B receives a yard gully (3) which takes a sink waste, a rainwater pipe, and a bath

and lavatory waste; 5 is a soil and ventilating pipe passing into same chamber.

C is the disconnecting chamber (see Fig. 20) with a rain-water pipe (6) and a gully (3) for the stables, both having a gully as Fig. 16, and a fresh-air inlet or ventilating-pipe (9).

Fig. 16 shows an open gully, which is a trap with a turn-table top, and has as many inlets as required, which can come in horizontally or vertically, or both. It shows two vertical inlets, and has an open grating fitted loosely on the top.

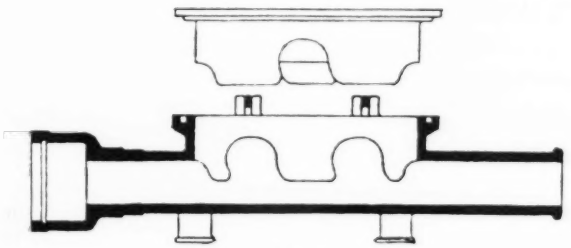


Fig. 19.

Fig. 17 shows a similar gully, except that it is fixed inside the building in certain positions at the bottom of stacks of pipes that do not conduct any foul waters or matters. The top of this trap is sealed down with nuts and bolts or similar appliances, and a further ordinary cover is fixed at floor level, as shown.

Fig. 18 shows an automatic flushing grease-trap. An automatic flushing tank, shown by Fig. 9, is fixed with this gully; the wastes enter the side of the trap under the water level, and the grease congeals in the body of cold water in the trap.

The grease floats and forms a film or cake of grease on the surface of the water in the trap, and when the tank flushes it drives the water in the trap into the drain, thereby taking the support from the film of grease. At the same time the flush passes through the flushing rim of the trap and breaks the cake of fat or grease into small pieces and floats it away into the drains.

A cast-iron inspection pipe junction is shown by Fig. 19, and is for connecting two or more branch pipes to the main drain, and to give access to same for inspection and cleansing.

The capping is formed in such a manner that the inside line of pipe and branch pipe are kept perfectly true, as shown

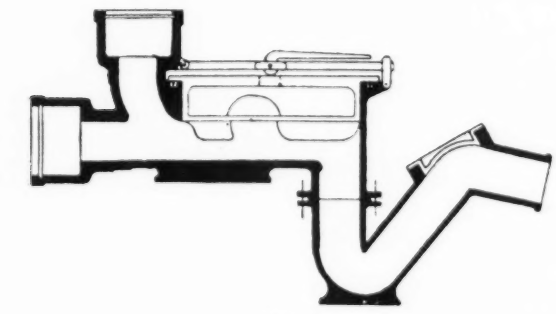


Fig. 20.

in Figs. 19 and 20. The cover has a seating which fits into a groove in the frame cast on the pipe, and a ring packing made of oiled leather or of asbestos. The cover is kept in position with bolts, levers, or bars, etc.

Fig. 20 is a disconnecting chamber, and is very similar to an inspection chamber, except that it is provided with an opening for ventilation and a trap at the outgo to form a water seal, which acts as the disconnector and gives its name to the chamber.

An estimate of total cost of cast-iron and stoneware drains, per foot run of straight work, is: Cast-iron, 3s. 9d.; stoneware, 2s. 6½d.

These figures are made up as follows:

Per foot run.	Cast-iron.	Stoneware.
	s. d.	s. d.
Supply, lay and jointing	2 3	0 6½
Ground work, 6 ft. × 2 ft.	1 0	1 0
Concrete	0 6	1 0
Total	3 9	2 6½

From these figures it can be seen that cast-iron drains cost about 30 per cent more than stoneware; but the great advantages are certainly worth the extra cost. There is, however, a saving in wages, because the workmen do not have to waste time by waiting for the material to set so that a water test can be applied. Hence a length of iron drain can be laid, jointed, tested, and the trench filled in on the same day, whereas a stoneware drain could not be laid, finished and covered in under two days.

In conclusion, it may be said that iron drains make the best and most serviceable of drainage schemes, and, incidentally, increase the work of the plumber, although it may be at the cost of the bricklayer.

EUROPEAN MEDAL FOR AMERICAN INVENTORS.

The Allegemeine Electricitaets Gesellschaft (A. E. G.), of Berlin, has cabled President Arthur Williams of the American Museum of Safety, New York City, that the Rathenau gold medal has been placed at the disposal of the Museum for award annually for the best device or process for safeguarding life and limb or promoting health in the electrical industry. The competition is open to every country in the world, the only condition being that the device or process must be exhibited at the American Museum of Safety in New York City. This is the first time that the bestowal of a high European honor has been given to an American institution and indicates the standing of the American Museum of Safety among European scientists. The Rathenau medal is well known in the European scientific world. It was presented to Dr. Emil Rathenau, president and founder of the Allegemeine Electricitaets Gesellschaft, the largest European electric company, on the occasion of his 70th birthday, with the felicitations of the Kaiser for his services in the field of electro-technics. (He was the man who introduced incandescent lighting into Germany.) One medal will now be cast each year from the original die for the American Museum of Safety to award.

With the Hoboes.

"Pete, deres a farmer up de road dat says he'll give you $2 for a day's work!"

"What's de use of temptin' me when you know I ain't got de time. You orter understand dat, out o' practice like I am, it 'ud take me at least six weeks to do a day's work."—"Journeymen Plumbers' Journal."

IN THE SALES CIRCLE.

By "The Spectator."

Smile and your customer smiles with you. Many a sale is made on a smile that might have been lost on a bushel of argument. The buying public demands a heaping measure of good nature as a premium on every bill of goods and that's why the popular picture of a traveling man is a rotund, moon-faced "Sunny Jim," who seemingly has nothing to do but to keep himself and those around him in a perpetual state of good humor. And that is as it should be. Without the leaven of good nature this old world would be a pretty dreary ball of dough and heating or plumbing would be about as pleasant as a funeral. But beware!

The game of sales, like all other games worth playing, is governed by rigid rules and one of these is, that no injurious mis-statement shall stand unchallenged. It is no time to bend a gracious bow and add another sweet smile to the world's fund of good nature when your customer insinuates that plumbers are worse than the robber barons of the middle ages. Neither is it any time to take him by the coat collar and chuck him into the street, but the pat, right-up-to-the-minute come-back is an emphatic denial that plumbing contractors are high-handed mercenaries whose license from the state allows them to plunder at their pleasure.

The probability of getting away with good sound arguments about quality of goods and high standard of workmanship, after an omission to nail the "exorbitant price" lie, is about equal to the chance of selling a cargo of olives to the natives of Labrador.

Often the retort emphatic dies on the lips owing to a timorous reluctance to say anything that it is feared may offend and drive the prospect with his wallet down the street to Jones' shop.

Erroneous reasoning, that has no place in sales philosophy! Erroneous reasoning that every salesman, no matter what he sells—be it tea and allspice, radiators and plumbing fixtures or jobs of heating and plumbing, must purge from his mind before he can hope to hold place with those who know the rules of the game. All real ones: Those who can write, "Master in Salesmanship" after their names have their in and out shoots, their spit-balls and floating drops—each according to his own individual style of play but all of them follow the rules.

We each have something to sell. Some of us, plumbing and heating materials, together with our knowledge of plumbing and heating.

Do we realize how important it is that we should be salesmen—"classy salesmen"—as the boys on the road say?

To be "classy salesmen" we must lay a foundation of enthusiasm for the high repute of our particular business and we must remember that it is one of the elementary and most important rules of the game, that we chuck our hats into the ring when anybody—even a customer—takes the liberty of making injurious mis-statements about it.

FALSE STATEMENTS BY BORROWERS NOW PENAL OFFENSE.

On September 1st an amendment to the penal law went into operation relating to borrowers' attempts to obtain property or credit by use of false statements. This practice has resulted in heavy losses to banks, and at the instance of the New York State Bankers' Association legislation was introduced at Albany several years ago to check the evil.

The new law follows:

AN ACT to amend the penal law, in relation to larceny.

Became a law April 15, 1912, with the approval of the Governor, Passed, three-fifths being present.

The people of the State of New York, represented in the State of New York, represented in Senate and Assembly, do enact as follows:

Sec. 1. Article 122 of chapter 88 of the laws of 1909, entitled "An act providing for the punishment of crime, constituting chapter 40 of the consolidated laws," is hereby amended by inserting a new section, to be section 1293-b and to read as follows:

Sec. 1293-b. Obtaining property or credit by use of false statement. Any person

1. Who shall knowingly make or cause to be made, either directly or indirectly, or through any agency whatsoever, any false statement in writing, with intent that it shall be relied upon, respecting the financial condition, or means or ability to pay, of himself, or and other person, firm or corporation, in whom he is interested, or for whom he is acting, for the purpose of procuring in any form whatsoever, either the delivery of personal property, the payment of cash, the making of a loan or credit, the extension of a credit, the discount of an account receivable, or the making, acceptance, discount, sale or indorsement of a bill of exchange, or promissory note, for the benefit of either himself or of such person, firm or corporation, or

2. Who, knowing that a false statement in writing has been made, respecting the financial condition or means or ability to pay, of himself, or such person, firm or corporation in which he is interested, or for whom he is acting, procures, upon the faith thereof, for the benefit either of himself, or such person, firm or corporation, either or any of the things of benefit mentioned in subdivision 1 of this section; or

3. Who, knowing that a statement in writing has been made, respecting the financial condition or means or ability to pay, of himself, or such person, firm or corporation, in which he is interested, or for whom he is acting, represents on a later day, either orally or in writing, that such statement theretofore made, if then again made on said day, would be then true, when, in fact, said statement if then made would be false, and procures upon the faith thereof, for the benefit either of himself or of such person, firm or corporation, either or any of the things of benefit mentioned in subdivision 1 of this section.

Little Boy Wanted Divorce.

The lawyer was sitting at his desk absorbed in the preparation of a brief. So bent was he on his work that he did not hear the door as it was pushed gently open nor see the curly head that was thrust into his office. A little sob attracted his notice and, turning, he saw a face that was streaked with tears and told plainly that his feelings had been hurt.

"Well, my little man, did you want to see me?"

"Are you a lawyer?"

"Yes. What do you want?"

"I want"—and there was a resolute ring in his voice—"I want a divorce from my papa and mamma."—New York Mail.

Avoiding Trouble.

"Your wife never contradicts you in public."

"No. That's one of the reasons we've lived happily together for twenty years."—Detroit Free Press.

Closed or Open Windows With Mechanical Ventilation

Paper by Ralph C. Taggart, Read Before the American Society of Heating and Ventilating Engineers, at Its Meeting in Detroit, Mich., July 11-13, 1912

There has been some discussion of late in regard to the question of ventilation by open windows and certain misstatements have gained considerable publicity. It would appear that the heating fraternity is partly to blame for some of these misconceptions. The advocates of the open window ventilation usually maintain that ventilation should be by means of the open window and nothing else, while the advocates of ventilating systems often claim that the ventilation should be left entirely to the ventilating systems installed and that the opening of windows should not be allowed. It is claimed that the opening of windows will upset the balance of the ventilating system and make it ineffective. This closed window rule has been enforced to such an extent that students in some schools have been suspended or expelled from school because of the opening of a window.

The general question will be taken up later in this paper, but the author may say here that he believes no ventilating system should be installed in which the balance of the system is appreciably affected by the opening of windows. In other words, where the outdoor air is reasonably good and fairly free from dust, etc., a mechanical ventilating system will give as good or better results when used in conjunction with open windows than in any other way, and, further, the engineer who insists upon closed windows is making almost certain the unsatisfactory operation of his apparatus.

Let us first, however, consider one or two fundamental questions in connection with this matter. The first question is what is meant by good ventilation. Some one will answer pure air. But we may ask how we know when we have pure air, and if we are talking to a layman or perhaps to a doctor he may say, "I can tell pure air the minute I enter a room," and this is the way the air is judged by most people. In other words, pure air is what appeals to the senses as pure or refreshing. Good ventilation does not then for most people mean chemically good air. It means air which makes one feel good.

The ventilating engineer has usually said that air which would pass certain chemical standards was good air, and, while the ventilating engineer of today has changed some of the old standards by which air was judged, he is still holding to a chemical test of the air.

To the ordinary man, however, air which makes him feel good or which he judges as good air is air which meets certain physiological requirements or, in other words, air which makes him comfortable. Now these physiological requirements are not the same for two different individuals, and they are not the same for the same individual at different times of the day or on different days. In the case of many individuals considerable variation may be allowed in most of the qualitative conditions of the air without much discomfort, while in other cases persons whom we sometimes call sensitive can stand only very small variations in the air conditions which surround them without feelings of discomfort.

As an illustration the author may cite the case of an able surgeon who on one occasion was well satisfied with the air conditions in one of his hospital wards, while he was very much dissatisfied with the air some two hours later, when a careful examination indicated that the conditions were exactly the same. He himself had, however, in the meantime indulged in some exercise and also eaten a hearty meal, so that undoubtedly a lower temperature or perhaps a lower humidity of the air would have been required to produce in his body the same physiological sensations which he had experienced when he declared some two hours earlier that the air in the hospital ward was very good.

The question of ventilation involves, therefore, a question of comfort to the occupants of a building which cannot be eliminated, and this will be frankly acknowledged by the ventilating engineers when their attention is called to the matter. The best that we can hope to do, therefore, in ventilating a room in which there are many people, is to provide healthful air which will as nearly as possible satisfy the physiological requirements of the average individual. There has been an attempt in theater and auditorium ventilation to arrange the apparatus so that the quantity of air reaching an individual may be varied. The hope, however, of varying the quality of the air which reaches different individuals in a room with many occupants in order to suit individual requirements seems to be beyond the hope of realization at least for the present.

There is one other factor, however, that should be referred to under the head of the comfort of the individual, and that is the amount of comfort or satisfaction that an individual can gain by the impression or belief that he is really comfortable. We all have heard and seen enough of such instances as the change in the position of a thermometer, making people who thought they were cold believe that they are really warm, to know that the influence of an impression as to how they ought to feel is a very real thing to most people. When we, therefore, tell the occupants of a building that the windows cannot be opened we at once create a desire to open the windows and introduce an element which breeds dissatisfaction.

Aside, however, from all imagination, we should allow the occupants of a room some easy means of changing air conditions within the room. No matter how carefully the system is operated, it cannot meet all individual requirements, and if the opening of windows is not allowed, the simplest, and in many cases almost the only easy, means of controlling certain air conditions is removed.

Where the system itself is controlled automatically the author has known of some very unfortunate instances resulting from the rule forbidding the opening of windows. The automatic apparatus only needs to get out of order one day during the year in order to overheat a room and cause discomfort if windows cannot be opened. This often results in a general animosity toward the heating apparatus that is astonishing, although we ourselves might feel as strongly if forced to undergo equal discomfort.

A ventilating system, to be satisfactory, must then have means of individual adjustment to suit the particular needs of the occupants, and almost the only easy way to vary the quality of the air, and often even the temperature, is by opening the windows.

Let us then consider the question of open-window ventilation. Open-window ventilation in rooms occupied by a number of people does not mean and does not result in ventilation by open windows in cold weather, because in the majority of cases the occupants will not keep the win-

dows open. Open-window ventilation, therefore, when used alone, means practically no ventilation in the colder weather. In hospitals, with patients in beds, there is the best chance for open-window ventilation, and yet the author has been in a number of hospitals where the doctors were advocating open-window ventilation, and in the colder weather everything was shut up tight and there was no ventilation except leakage through cracks that could not be closed.

In private houses, where the occupants are few, leakage through cracks and air entering through windows which can be opened may give a reasonable air supply. In crowded buildings, however, such as schools, etc., open-window ventilation in cold weather usually means no ventilation.

Let us then consider the question of mechanical ventilating systems with warmed air. It is claimed by some that air warmed and then admitted to a room is injured and air so admitted is sometimes styled "canned" air. Perhaps it would be better to call it sterilized air. If the air is properly washed, the amount of dust remaining is very small, and even if it were all burnt up by the few degrees of warming, the decrease in the oxygen content of the air would be negligible. Air in passing through a steam heater need not be warmed to the excessive temperatures often stated. In fact, some writers on ventilation talk of heating air to 300 and 400 deg. by steam. This is manifestly impossible with steam at 212 deg. F. It is also impossible to heat air in a ventilating apparatus as high as 212 deg. with steam at 212 deg., and it is easy, on the other hand, to arrange the apparatus so that practically none of the air is heated above 98 deg., or blood heat, and so that the average temperature of the air is not raised above 60 or 70 deg., or even 50 deg. or lower, if it is so desired.

Many doctors appear to have the idea that ventilating systems must overheat the air. This, of course, is not so. The air entering the room may be as cool as desired. It seems reasonable, however, to say that it should be warmed sufficiently so that the occupants will allow it to be admitted. Otherwise, we have no ventilation in the sense of admitting fresh air.

Let us then consider the question of using open windows in connection with a ventilating system where air is taken from out-of-doors, and where it is washed and blown through suitable ducts to the various rooms of the building. Some engineers maintain that if windows are opened in rooms supplied with air from a fan or blower a large part of the air supplied by the fan will immediately pass to the rooms in which the windows are open, and that the other rooms will not receive their proper proportion of air, or, in other words, it is maintained that the distribution of the air will be seriously interfered with.

Investigation shows that the tendency of air to enter a building through open windows is much greater than the tendency to suck air out from a room through open windows. This is due to two facts: first, a building acts to a considerable extent like a chimney, and, second, the inertia of the air when there is any breeze is much more effective in bringing air in through an open window than in sucking air out.

The engineer may say, however, that it is a question of pressure and that with the ventilating system in operation the various rooms are carried under a considerable pressure. This is a mistaken notion with the ordinary ventilating apparatus. With vent or exhaust flues of any reasonable size, plus also the chances for air leakage around the room itself, it will be found in rare instances only in a ventilating apparatus that the pressure in any room is sufficiently above the outdoor pressure so that it may be measured in any except perhaps the most delicate of instruments. The additional flow of air, therefore, is usually very small in a room with open windows, because of any lessening of pressure within the room. In fact, with the air blowing into a room from out-doors it will be found that, while the total air admitted to the room is greater with the windows open, the air entering the room from the ventilating apparatus is less, so that more air, rather than less, is left for the other rooms.

Let us assume a room, however, in which considerable pressure is carried within the room itself, although this shows a very faulty design in the ventilating equipment. In such a case the opening of windows on a particular day when the wind is most effective in removing air from the room will cause an excess of air to enter the room from the ventilating apparatus. This excess, however, is not so great as might be imagined, especially if the connections in the branch flues from the main ducts to the individual rooms have some appreciable resistance, as they usually do.

The increase in air supply varies only as the square root of the increased difference of pressure, and if in the original design the branch connections have been slightly choked so as to place the larger part of the duct resistance in these branches, the increase in air discharge into a room with open windows may be made practically negligible. Some may say that this resistance in the branch connections is very undesirable. This is not so if the main ducts are made of proper size so as to minimize the friction within them, and this is desirable, for the main ducts are usually horizontal ducts, and the horizontal ducts should always be large enough to be easily accessible and large enough so that the total friction resistance within the duct system is small. If the friction in the main ducts is small, the friction in the branch connections may also be small and yet large enough so that the friction in the main ducts is negligible in comparison.

How small an increase in duct sizes is required to reduce the friction in ducts is often not appreciated. For the same quantity of air delivered the friction varies inversely as the fifth power of the diameter, so that if the diameter of a duct or pipe is doubled, its friction is reduced to 1-32 of its former value. If the duct is increased in diameter only 50 per cent, the duct whose diameter is two-thirds of the other duct has a friction resistance more than seven and one-half times as great, or if the diameter is increased only one-fourth, the friction resistance is reduced in the ratio of more than three to one.

It has come to be the practice in many cases in ventilating apparatus to reduce the sizes of ducts, etc., to such an extent that many of the horizontal ducts are practically inaccessible and so that the friction resistance in the apparatus results frequently in the closing down of the apparatus because of the power required to operate the fan, especially if connected to a motor taking electric current, which may cost 5 to 10 cents per kilowatt-hour. Main ducts and main branches, therefore, should be made large, while vertical branches should be properly reduced.

If then the windows may be opened even with the ordinary fan system of heating, some one may say that the good air from the ventilating system will escape directly out-of-doors. Generally speaking, this is not so, and in the special instances where they occur, short circuits from the air inlets of the ventilating apparatus to open windows are easily rectified.

Some, however, may say that whereas we get pure washed air from the ventilating apparatus, we get only dusty air from the windows. This is denied by open-window enthusiasts. The truth lies between these two statements. In very dusty localities there may be con-

siderable objection to admitting air directly from out-of-doors without washing or cleaning it, but I believe there are few who will not acknowledge that we get pretty good air in summer through open windows, and if it is good enough for us in the summer it should not be rejected because of similar chemical constituents in the colder weather.

In regard to the question of humidity, the opening of windows for admitting air may change the humidity of the air, but if it renders the room more habitable and comfortable the author sees no reason why it should not be considered an improvement.

In regard to comfort, on the other hand, there is an element of temperature stratification of the air which seems to be stimulating and invigorating to many people. In other words, air at a dead uniform temperature is not so desirable as air in which there are some differences in temperature. This can be carried too far, however, especially with people of sluggish circulation. In so far as it is desirable it can often be obtained very easily by the opening of windows in conjunction with the ventilating system. It can also be obtained without open windows, but usually not nearly so readily.

Open windows used in conjunction with ventilating systems in general, therefore, increase the quantity of fresh air supplied; provide means for admitting cool air; give an additional temperature control, and often furnish an easy method of adding to the possible comfort of occupants. Open windows, therefore, should not in the average case and absolutely cannot in a well-designed ventilating apparatus interfere with the operation of the ventilating system.

BALTIMORE MASTER PLUMBERS ENTERTAIN FORMER AND PRESENT NATIONAL OFFICERS.

On Thursday, August 29th, members of the Baltimore, Md., Association of Master Plumbers had as their guests several of the present, as well as past officers of the National Association of Master Plumbers, and these honored guests were entertained by their Baltimore

Aug. V. Eidman, Chairman of Arrangement Committee.

brothers in true Maryland fashion. The surprise in waiting was in the nature of a "Crab Feast" and the markets for sea food in general were ransacked for their choicest specimens. Miller's Park, Dundalk,—on the beautiful Patapsco River—was the scene of these festivities and many of the members and their guests motored out there. It was a splendid day and the afternoon was given up to a warmly contested ball game between master plumbers and salesmen, while those less strenuously inclined frequented the dancing pavilion or wandered off through the grounds. Promptly at 5:30 p. m. a genuine Maryland dinner was served and plates were laid for fully 200 people. Course after course was served and those who were not familiar with the Maryland cooking found that they had not realized before what a real treat a Maryland chef could offer. Former National

"John Trainor Acted as Toastmaster."

President John Trainor, of Baltimore, acted as toastmaster and, in his own inimitable way, spoke most interestingly of the "ladies" and his fluent eulogy on the "fair matron" of Maryland brought forth round after round of applause. He in turn called upon National President Frank J. Fee, of New York City, whose impromptu address was listened to with great interest. National Treasurer Wm. McCoach, of Philadelphia, spoke interestingly on association affairs and he was followed by past presidents: Walter Nolan and Ed. Hannan, of Washington, D. C.; Wm. H. Doyle, of Philadelphia, Pa., and Wm. H. Rothrock, of Baltimore, Md.

The committee which arranged for this occasion deserves praise for its work. It included August V. Eidman, Chairman; Frank J. Knell, Lloyd E. Mitchell, Chas. H. Frederick, Chas. I. Putts, Jr., August Malthan, Wm. H. Mitchell, Edward Wehrhahn, L. B. Marshall and John J. Pirie.

His Blasted Life.

"You refused me ten years ago."

"I remember. You said it would wreck your life."

"It did. I have had to work for a living ever since."

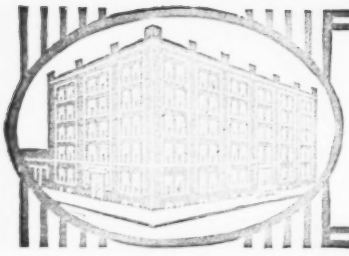
A Youthful Quibbler.

Caller—"So you go to school, do you, little man? Let me hear you spell 'bread.'"

Bobby—"B-r-e-d."

Caller—"The dictionary spells it with an 'a.'"

Bobby—"You didn't ask me how the dictionary spells it; you asked me how I spell it."—Boston Evening Transcript.



News of Interest Among the Wholesalers and Manufacturers

NOW PRESIDENT OF THE STERLING BRASS MFG. CO.

E. C. Flaeishman, who has been connected with manufacturers of brass goods in Cleveland, O., for the past fourteen years, has been appointed president and manager of the Sterling Brass Mfg. Co., manufacturers of plumbers' brass goods, at 47th Street and St. Clair Avenue, Cleveland, O.

SECURES ADDITIONAL MANUFACTURING FACILITIES.

The continuously increasing demand for its cast iron boilers made it necessary for the Novelty Iron Co., of Canton, O., to increase its manufacturing facilities. The company was fortunate in securing the foundry formerly owned and operated by the Canton-Hughes Pump Co., of that city. With its present capacity, the company is well equipped to render its customers prompt and efficient service.

NEW PLUMBING SUPPLY JOBBER IN PHILADELPHIA.

MacMullen & Co. is the style of a new firm to enter the plumbing supply field in Philadelphia, Pa., and they have leased a building 100 x 25 feet, at 1037 Race Street, in that city. Mr. MacMullen has been employed by the Thos. J. Berkstressor Co., also of Philadelphia, as city salesman, and associated with him in this enterprise is A. V. Openshaw, formerly secretary of that company.

PRESSED RADIATOR COMPANY SOLD AT AUCTION.

The Pressed Radiator Company of America has been sold at public sale in the Allegheny County Courthouse at Pittsburgh, Pa., to F. C. Perkins, who represented the bondholders of the company. The property brought $200,000. The plant is located in Taylor, Lawrence county, Pa., and the property and business as a going concern were included in the sale. The company is incorporated at $1,250,000 and had $374,300 outstanding in capital stock.

THE ANNUAL FIELD DAY OF MASSACHUSETTS CHAPTER OF A. S. H. & V. E.

Colonel Everett C. Benton, candidate for the Republican nomination for governor in Massachusetts, was the principal guest and speaker at the annual field day of the Massachusetts Chapter of the American Society of Heating and Ventilating Engineers, held at Wayland. Other guests included members of the Ancient and Honorable Artillery Company of Boston, Congressmen Samuel W. McCall and John W. Weeks, Councillor Alexander McGregor, District Attorney John J. Higgins, of Middlesex County, John J. Irwin, member of the state board of Agriculture and others. Colonel Benton discussed the state tax.

DAVID M. FORKER IS DEAD.

David M. Forker, vice-president of the D. T. Williams Valve Co., Cincinnati, O., died August 29, 1912, in his fifty-second year. Mr. Forker had been in ill health for some time prior to his death.

WILL INTRODUCE GAS HEATING SYSTEM.

The Massachusetts Vacuum Gas Heating Co., a new firm just organized, has opened offices on the second floor of the building at 91 Bedford Street, Boston, Mass. The firm is endeavoring to introduce a new system of heating which it claims will revolutionize the heating of houses throughout the country. Their apparatus consists of a series of radiators, similar in appearance to steam radiators, connected with the illuminating gas system and thermostatically controlled.

THE E. W. FISHER CO. OUT OF THE HANDS OF THE COURT.

The receiver for The E. W. Fisher Co., Cleveland, O., who was appointed May 31, 1910, was discharged by the U. S. Court on Aug. 29. On Feb. 15 of this year, J. H. Lehmann bought a controlling interest in the stock of this company, and it was largely through his efforts that a satisfactory adjustment was made with the creditors. Mr. Lehmann is a young man of long experience as a salesman, having had charge of the western territory of The Borden Co., Warren, O., for seven years. Mr. Lehmann has retained nearly all of the old sales force, and the company now has a bright outlook for a successful future.

THE RICKERSBERG BRASS CO. ENLARGES ITS PLANT.

The Rickersberg Brass Co., Cleveland, O., has broken ground for several new additions to its present plant. These additions will consist of one building, 60x70 ft., which will be used for polishing and buffing rooms; one building, 50x30 ft., which will be used for core rooms; another building, which is now being constructed, will cover a space of 50x60 ft. and will be an extension of the present foundry. All these buildings are of steel construction, with modern saw-tooth roof, which, according to the contractors, will be in keeping with the present modern plant. Regardless of the rapid growth of this company's business, and in time of such extensive improvements, the appearance of the exterior and the sur-

roundings of the plant have not been overlooked. The flower beds and the beautiful lawn, which cover over 34,000 square feet of ground at the Rickersberg plant has been the subject of much very favorable comment on the part of Cleveland citizens and would certainly carry away the banner in most any "city beautiful" contest.

PERSONAL MENTION.

S. Mettler, formerly buyer and sales manager for the Standard Mfg. Co., of Cleveland, O., is now connected with the E. W. Fisher Co., of Cleveland.

* * *

W. H. Fifield, formerly connected with the Peerless Selling Co., of Evansville, Ind., has been appointed New England representative for the Knott Mfg. Co., of Fort Wayne, Ind.

* * *

T. W. Openhauser, representative for the Buckeye Tank & Seat Co., Canton, O., has just returned from a successful trip through Pacific Coast territory and is making preparations for a southeastern trip which will include a journey to Cuba.

* * *

Ike Newman, traveling representative for The Kennedy Co., of Cleveland, O., met with a very painful accident while boarding an Erie train at Youngstown, Ohio, for Meadville, Pa., on August 25th. Mr. Newman was just entering the railroad coach when an extra heavy jerk of the train occurred, throwing his foot between the ends of the coaches, where it was severely crushed. He is now confined to his home in Cleveland, and two weeks will probably elapse, before he can again be among his many friends in the plumbing trade.

GEORGE E. DOWNE DEAD.

George E. Downe, vice-president and general sales manager of the Novelty Iron Co., of Canton, O., died at his home on New Berlin road in that city, Wednesday evening, September 4th, in his fifty-fifth year. This intelligence will come as a great shock to his many friends in the heating trade in all parts of the country, as he was probably one of the best known men in this trade in the United States, and had a remarkable ability for making friends.

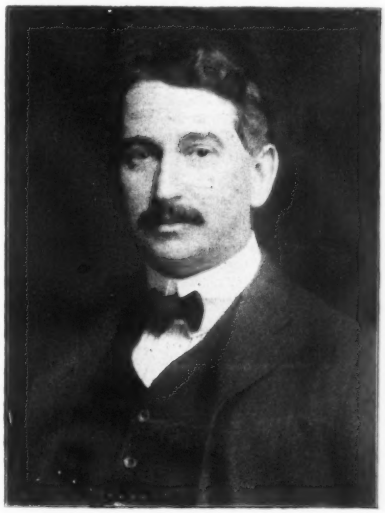
Mr. Downe was born in Winchester, New Hampshire, October 23, 1857, and he received his technical education in Worcester, Mass.

In company with his brother, Henry S. Downe, at present director of the enterprises of the American Radiator Co. in Europe, he organized in 1887 the National Hot Water Heater Co., for the purpose of manufacturing the "Spence" hot water boiler, acquiring the right to its manufacture and sale from Warden King & Son, of Montreal, Canada, the decedent being president and general manager of the company in 1892.

In 1892 he undertook the organization of the American Boiler Co., a corporation which acquired the right to manufacture and sell boilers, which, up to that time, had been procured by the Pierce, Butler & Pierce Mfg. Co., of Syracuse, N. Y., the Richardson & Boynton Furnace Co., of New York, and the National Hot Water Heater Co., of Chicago and Boston, Mr. Downe assuming the position of vice-president and general manager.

After one year, and late in 1893, owing to differences of opinion within the organization regarding its policies, Mr. Downe resigned his position from the company. Shortly thereafter the American Boiler Co. went into liquidation.

In 1893 Mr. Downe organized the Ideal Boiler Co., which brought out the original "Ideal" boilers, and this company, under his direction, made remarkable progress in the introduction of these goods. In 1896 the American Radiator Co., having decided to take up the manufacture of house heating boilers, in connection with its radiator business, acquired the boiler business of this company, and have since that time made phenomenal success, Mr. Downe being in charge of the management of that department of their business up to November, 1909, when he joined the J. H. McLain Co., of Canton, O., as general manager. In 1911 he became vice president



The Late George E. Downe, Canton, O.

and sales manager of the Novelty Iron Co., at the time of its reorganization, a position he held at the time of his death.

The funeral took place Friday afternoon, September 6th, at his late residence in Canton, and the interment the next day at Fitchburg, Mass.

In 1883 Mr. Downe married Miss Carrie Lucy Davis, of Burlington, Vt., who with four sons survive him.

"MADE IN PITTSBURGH" TRAIN ON ITS MISSION.

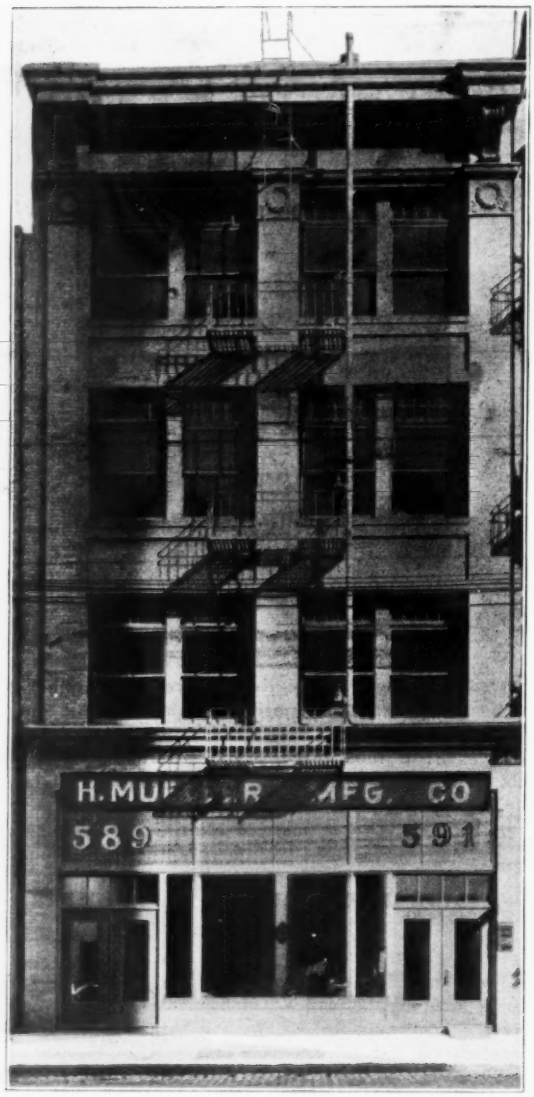
When the "Made in Pittsburgh" train pulled out of that city at 12:01 on the morning of September 10th, one of the clever exhibits was that of the Pittsburgh Sanitary Manufacturing Co., the exhibit being in charge of Secretary W. B. Bryar and Assistant Purchasing Agent P. A. Schuelsire. A number of late model lavatories were arranged on one side of the car, while adjoining this display was a model bathroom with all fixtures. This exhibit will be shown in eighteen states and nearly fifty cities where the train will stop. The train is being operated under the direction of the Pittsburgh Chamber of Commerce, of which the Pittsburgh Sanitary Mfg. Co. is a member.

WILL MANUFACTURE HEATING SUPPLIES.

The Monitor Bi-Loop Radiator Co., Lancaster, Pa., has filed articles of incorporation with a capital of $500,000. It is the purpose of this company to manufacture boilers, radiators, steam, water and electrical appliances.

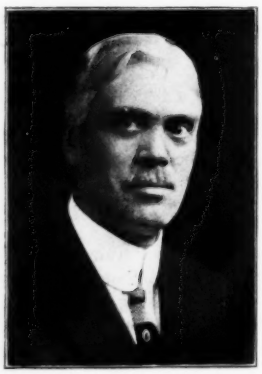
THE H. MUELLER MFG. CO. TO OPEN BRANCH IN SAN FRANCISCO.

Among many important changes and extensions being made in its business by the H. Mueller Mfg. Co., Decatur, Ill. and New York City, is the establishment of the Pacific Coast branch at 589-591 Mission street, San Francisco, Cal. The company is now organizing its office and additional sales force and completing arrangements for the installation of a large stock to be ready to turn over to the coast trade to this new branch within the next sixty days. Tom F. Leary will be in charge as general manager.

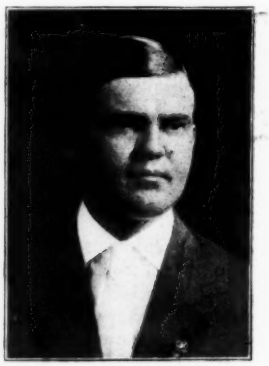


H. Mueller Mfg. Co.'s New Branch at 589-591 Mission Street, San Francisco, Cal.

The popularity and sale of Mueller goods have reached such proportions in the far west that the company has found it difficult to handle the business from the factory in the middle west as promptly as it desired to do. The determination was therefore reached some months ago to establish a western branch, and San Francisco was chosen as the most effective point from which to operate. The plans formulated in the spring culminated in the selection of quarters in the handsome building shown here. The Mueller Company will occupy the first floor and basement and carry a complete stock of its plumbing, water and gas goods so that shipments in the western territory can be made promptly.



Tom F. Leary, Manager Pacific Coast Branch.



W. L. Jett, Los Angeles, Southern California Representative.

The announcement of the selection of Tom F. Leary as general manager of the Mueller Pacific Coast Branch will be pleasant news to his legion of friends. The one regret they will feel will be the fact that his promotion carries him away from them to a new field of labor. Tom Leary is one of the finest examples of a brass goods salesman in the country. He has been a part and parcel of the plumbing brass goods industry from his youth until the present, and knows its ins and outs from the beginning to the end. He knows the manufacturer and the plumbers' side, and he knows the just and equitable dividing line between buyer and seller, and he will prove a valuable representative in upholding the business policy of the Mueller Company. Mr. Leary will have for his aids in the branch men who have been identified with the company, and who are familiar with the Mueller product. An organization will be perfected which will prove efficient and effective.

C. H. Dubois, New Salesman in Illinois.

Ed. Pedlow, St. Louis, Missouri Representative.

The opening of the Pacific Coast Branch brings about a number of other changes in the Mueller traveling sales force.

W. L. Jett, who was formerly in the shipping depart-

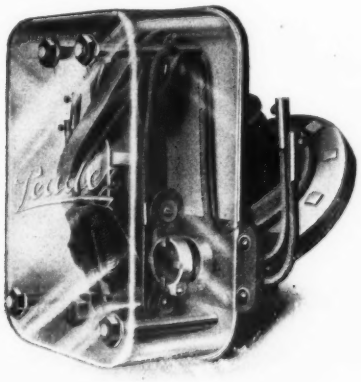
ment at Decatur and the Chicago branch, and later has been the Illinois salesman, goes to California. He will travel for the Pacific Coast Branch with headquarters at Los Angeles. He will be succeeded in Illinois by C. H. Du Bois who recently joined the Mueller forces.

Ed Pedlow, an experienced brass goods salesman widely known to the Michigan and Wisconsin trade, succeeds to Tom Leary's territory, traveling out of St. Louis, Mo.

The establishment of the Pacific Coast Branch will be a convenience to Mueller friends and patrons on the coast, and is only another instance of the desire of the company to give the quickest and best possible service to its patrons. The parent plant at Decatur, Ill., is now represented by an Eastern Division at New York City, a branch at 179 N. Dearborn street, Chicago, the Pacific Coast Branch at 589-591 Mission street, San Francisco, and within the next few months by the factory now being erected at Sarnia, Ontario.

"LEADER" AUTOMATIC ELECTRIC CONTROLLER.

There is no one thing that makes an electric water supply outfit more satisfying to the owner and the dealer than an automatic controller that can be depended upon month after month and year after year. The "Leader" automatic controller, Fig. 239-E., shown herewith is built in such a manner that the contact and release are almost instantaneous. The double pole action and the carbon to carbon contacts insure long and reliable service. The use of this controller on an electric water supply system provides a means of keeping the pressure within a safe margin, without the owner's attention being given to the outfit except for occasional oiling. Without doubt a

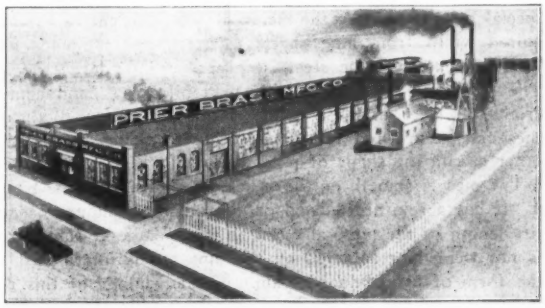


The "Leader" Automatic Electric Controller.

controller that will year after year operate on the variation of pressure for which it is set, is preferable to one that is mechanically constructed in such a way that it will eventually run down under continued service. This controller has been tested through a series of operations equivalent to forty-five years of actual service, before any parts have broken or been damaged by wear. The mechanical parts are simple, and are protected by a molded glass cover, similar to those used on an electric meter. This controller is manufactured by the Leader Iron Works, Decatur, Ill., and Owego, N. Y., who will gladly send full particulars and prices upon request.

PRIER BRASS MFG. CO. ACQUIRES NEW PLANT.

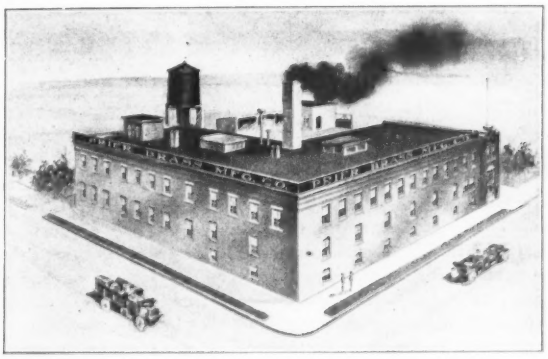
The Prier Brass Mfg. Co., of Kansas City, Mo., has recently issued an attractive catalogue announcing to the trade that it has taken over the plant and business formerly operated by the Central Brass Works Co., of Kansas City. The company now operates two plants



Prier Brass Mfg. Co.'s No. 1 Factory, at 15th Street and Blue River Blvd., Kansas City, Mo.

which are modernly equipped and well adapted to the manufacture of plumbing brass goods. The accompanying halftone engravings show the company's factory No. 1 and factory No. 2, with a combined working floor space of 37,500 feet.

The catalogue contains illustrations accompanied by descriptions of Standard self-closing faucets, back water drains, frost proof closets, iron drum traps, refrigerator and porch drains, cast iron cleanouts, vented drains, hopper stop and waste cocks; the well known Sieben back water drains, brass and lead grease traps and bath traps; a complete line of Prier compression and quick compression faucets, and other plumbing specialties which are manufactured solely by the Prier Brass Mfg. Co.



Prier Brass Mfg. Co.'s No. 2 Factory, at Goodrich and Central Streets, Kansas City, Mo.

The book also illustrates a number of prominent buildings in which Prier brass goods have been introduced and are working successfully. Any one of our readers who has not received this catalogue can procure a copy by addressing a card to the Prier Brass Mfg. Co.

Baudette, Minn.—A new concern known as the Baudette Plumbing & Heating Co. has recently opened business in this city. The organizers are: Messrs. Sage and Russell, who were formerly in business at Rainy River, Minn., and Lawrence Hawkins, who has been connected with William Bros. in this city.

REINFORCED GALVANIZED SPIRAL STEEL PIPE.

The Standard Spiral Pipe Works, 25 N. Dearborn Street, Chicago, are placing on the market a reinforced galvanized spiral pipe which is made from two strips of steel of different widths, and with a continuous interlocking seam. Both strips of steel are rolled down to shape on the edges, are interlocked and rolled down under very heavy pressure in a special machine. First the strips of steel are cut to the required width from long sheets of steel, and the ends are welded together. The steel is then placed on large spools. The strip used for the outside or reinforcing band comes from the steel mills in long lengths on reels. Both of these strips are fed into the machine, coming out at the other end in the shape of pipe.

The pipe is smooth on the inside, as shown by Figs. 1 and 2. It has a reinforced band on the outside running the entire length of the piece and can be made endless. This strip is not welded or soldered on the pipe but is interlocked in the form of a continuous seam. The advantage of this reinforced band and smooth inside can be readily seen, as there are no rivet heads on the inside to cause frictional resistance. Fig. 3 shows a section of riveted steel pipe.

Fig. 1.

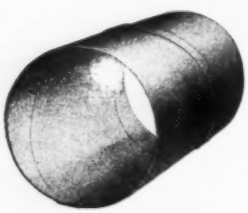


Fig. 2.

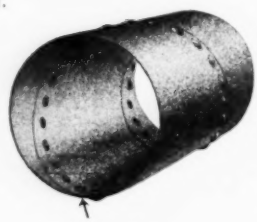


Fig. 3.

Fig. 4.

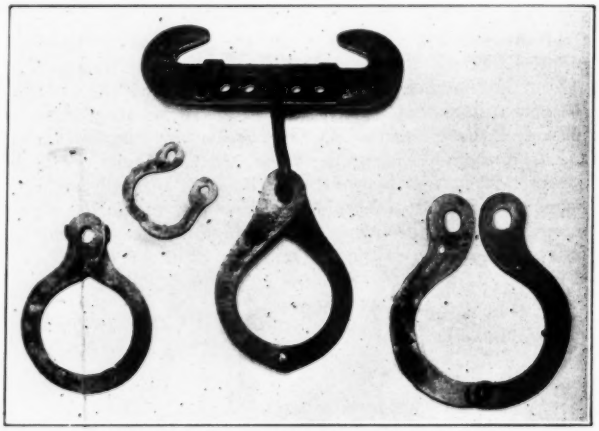
A soft open-hearth steel is used which will stand the required bending and is not weakened by being punched full of holes at the edge. The manufacturers claim that the possibility of leaking in this pipe is not one per cent as great as that of riveted construction. It is also claimed that lighter gauges of this pipe can be used for pressure than of any other construction, because in winding the steel into spiral form, advantage is taken of all its tensile strength and stiffness. Being light in weight is an added advantage in moving the pipe from place to place, or installing it in difficult places. At the point where the reinforced band passes around the pipe, there are four thicknesses of metal. This pipe has successfully withstood a number of severe bursting tests.

All Standard reinforced spiral pipe is asphalted, coated or galvanized after completing, so that every part of the surface is thoroughly coated.

The method of connecting or joining lengths of Standard reinforced spiral pipe are much the same as that used on riveted pipe. This company is furnishing a slip sleeve joint made with a seamless sleeve welded into one end of the pipe. Lugs are also welded on the outside of both ends of the pipe. In making connections, one end is slipped into the other. The pipes are then drawn together by wires over the lugs and a good joint is obtained. Another style of connection produced by the company is a forged steel flange, electrically welded onto the ends of the pipe and furnished with bolts and gaskets complete, in any specified length. Fig. 4 shows continuous interlocking seam, forged steel flange connection at left and slip sleeve at right end. This pipe is said to be well adapted for the conveyance of any liquid material, water, gases, air or substances which it is desired to handle economically. Further information can be obtained by writing to the manufacturers.

PIPE HANGERS AND BEAM CLAMPS.

The H. & H. Bender & Hanger Co., 550 W. 25th Street, New York City, reports gratifying success with its pipe hangers and beam clamps, and states that there is a very lively demand for these products. From the standpoint of economy, the manufacturers claim that hangers equipped with loops made by the H. & H. bender will reduce hanger bills one-half, eliminate the cutting of pipe and threading of nipples, and that the time thus saved is equivalent to the cost of the hangers. And as a matter of convenience, the H. & H. bender can be set up



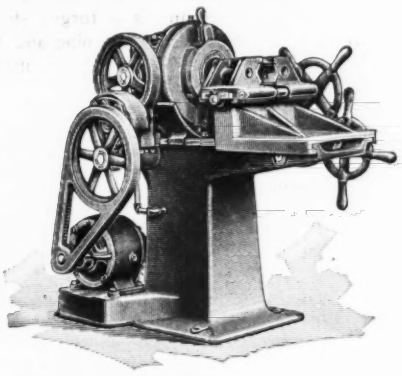
The H. & H. Pipe Hanger and Beam Clamp.

in any vise or screwed to bench. It weighs but six pounds and can be easily carried in a tool bag. Further particulars regarding these products can be obtained by writing to the company at the address above stated.

THE NEW OSTER PIPE THREADING MACHINE.

Interesting literature has just been issued by the Oster Mfg. Co., of Cleveland, O., setting forth in detail the merits of the new Oster pipe threading and cutting machine, made in three sizes, one model of which is illustrated herewith. This machine is constructed so that motors for direct or alternating current can be substituted at will. The machine and motor are on the same base, making the outfit perfectly rigid and easily portable. The special features claimed by the manufacturers are: Threading short pieces of pipe rapidly; open-type pipe vise enables operator to change the work instantly; lever operating die head enables operator to open and close dies by one movement of the hand, while the machine is in motion; die slots can be cleaned out without taking the head apart; special setting device which insures exact duplicate threads; base cast in one piece and contains the oil reservoir, which can be cleaned by removing a

plug; strainer located in center of pan separates oil from chips and drains oil back in tank to be used again, thus



The New Oster Pipe Threading Machine.

economizing in oil. Descriptive matter will be mailed to interested parties upon request to the Oster Mfg. Co.

ISSUES NEW CATALOGUE.

Among the trade catalogues recently issued, our attention has been called to Catalogue "D" of The Charles W. Schaffer Co., 1605 Sansom Street, Philadelphia, which is just off the press. The matter contained in this catalogue indicates careful preparation and it is nicely printed. The front cover showing some of the "Shafco" bathroom furnishings, is reproduced in this column. A complete standard line of these furnishings is clearly illustrated and described in the booklet. Particular attention is called to the company's white Pyralin finish on woodwork and brasswork, which is said to be durable and thoroughly

Front Cover Design of Chas. W. Schaffer Co.'s New Catalogue.

guaranteed not to discolor, peel or chip. The "Shafco" method of boxing glass shelves and towel bars in individual boxes has many advantages. "Shafco" bathroom furnishings are made in original and attractive designs. All metal used is brass—no steel or iron entering into their construction. Every plumber and dealer in bathroom furnishings should possess one of these catalogues. A copy will be mailed to any one desiring it upon request to the manufacturers.

S. Resek, national traveling representative of the Farnan Brass Works, Cleveland, O., is calling on master plumbers in Michigan towns at the present time. The "American Girl No. 17" announces his coming. This is a work of art which he is mailing his friends two or three days ahead of his arrival.

THE METAL MARKET

LARGE BUYING OF PIG IRON.

In the week, consumers of iron have purchased heavily in all centers. The leading purchase probably, the completion of the 25,000 ton order by the International Steam Pump Company, of this, at least 5,000 tons was placed in an Eastern market. The General Electric Company which has had a large inquiry in for some, has closed this, and the average price was somewhat below the general market. The radiator and boiler manufacturers have also been in the market and purchased several lots of from one to two thousand tons. A boiler manufacturer in Wisconsin has closed for 10,000 tons for a 1913 delivery. Business is being done at small figures and some sales were made at $13 Birmingham. This seems to be the thoroughly accepted price for next year's delivery, but some business for 1912 is being taken at $12.50. One order in the Birmingham market for a thousand tons of No. 2 Iron at $13 was refused. This shows the trend of the market. Several localities are asking somewhat higher prices, $15.45 is now quoted for 2X foundry.

Further production of pig iron during August is computed at 10,500,000 tons, compared with 2,400,000 in July. The total rate of production was about the same as May and June of this year, but it is still much lower than the latter part of 1909 and early 1910. Quotations are as follows:

No. 1 Northern Foundry, N. Y. $16.50 to $16.75.
No. 2X Northern Foundry, N. Y., $16.00 to $16.50.
No. 2 Southern Foundry Birmingham, $12.50 to $13.
No. 2 Southern Foundry Cincinnati, $15.50 to $16.00.
No. 2 Northern Foundry, Chicago, $15.50 to $16.00.

A LULL IN COPPER BUYING.

Sellers of copper in America have not purchased much in the last few days, European millers have likewise held off. This is in anticipation of their attendance at the Copper Producers' Association which will be published next week. It is believed that this report will show a strong position, but consumers are more willing to take the risk than sellers of the metal.

A SLIGHT ADVANCE IN TIN.

The market advanced rather suddenly and the last of August some sales were made at the terms thirty seven-fifty and forty-eight cents. Since that time, the general average has been around thirty-seven, twenty-five cents for large amounts. The total rate of this supply on August 31st was 11,285 tons a decrease compared with the same date last year of 5,000 tons.

A FURTHER ADVANCE IN LEAD.

The American Fuller and Refining Company has no advance in quotation for lead at this time, $4 per ton. The quotation in New York is now $4.85, the highest price of the year. Considered thus early, a good price, and there is some Fall Buying now. A real scarcity of lead is felt to exist.

THE OLD METAL MARKET.

Dealers' buying prices in New York are:

Light copper	$13.50 to	$13.75
Strictly crucible copper	15.25	15.50
Uncrucibled copper wire	14.87½	15.12½
No. 1 brass turnings	9.00	9.25
New brass clippings	11.00	11.12½
No. 1 composition turnings	11.75	12.00
Cocks and faucets	10.00	10.50
Light brass	7.25	7.50
Heavy brass	9.25	9.50
Heavy lead	4.35	4.40
Tea lead	3.90	4.10
Scrap zinc	5.37½	5.50
No. 1 pewter	31.00	32.00
No. 2 pewter	9.00	11.00
Close cut solder joints	8.75	9.25
Block tin pipe	42.00	42.50

MENOMONIE MASTER PLUMBERS HOLD ANNUAL PICNIC.

Thursday, August 15th, was chosen by the master plumbers of Menomonie, Wis., as the day for their annual picnic. Early in the morning the visiting plumbers and their families were met at the depot by August Shoenoff and family, who escorted the visitors to the dock, where a large motor boat loaded with good things to eat was waiting to transfer the crowd to Point Comfort, where the day was pleasantly spent. The program of entertainment was well arranged and sports of various sorts were indulged in. In the game of pitching horse shoe, Mr. McQuillian, of Chippewa Falls, and Thos. Bartingale, of Eau Claire, received highest honors. The first prize for winning the men's 100 yard dash was received by Bert Bartingale. There was also a ladies' running race which was won by Mrs. Carl Shoenoff, of Menomonie. The next feature of the day was a fast game of base ball. Batteries for Eau Claire: Heideman and Moe; batteries for Menomonie; Carl and Ernest Shoenoff. The first home run was made by Erhart, of Eau Claire. The game ended with a score of 1 to 0 in favor of Menomonie. After a bounteous supper was served, the picnickers were given a trip by motor boat up the river, where they visited the Training School, and then they returned to Menomonie, all having enjoyed the outing to the fullest extent.

Those present were Messrs. August, Carl, Ernest and Fred Shoenoff and families, Miss Kruger, of Menomonie, Mr. and Mrs. McQuillian and family, of Chippewa Falls, Mr. and Mrs. R. O. Bartingale and family, Mr. and Mrs. Thos. Bartingale, Mr. Moe and daughter Evelyn, the Misses Croll, Mr. and Mrs. Heideman and Mr. Erhart, of Eau Claire.

Very Decollete.

Husband—What did you pay for that new evening gown?

Wife—Fifty dollars.

Husband—What; $25 a yard!—Philadelphia Evening Telegraph.

TRENTON, N. J., MASTER PLUMBERS ENJOY ANNUAL PICNIC.

The master plumbers of Trenton, N. J., on Tuesday, September 10, journeyed to Hutchinson's Pond, about four miles distant, for their annual frolic. This event is always looked forward to by the Trenton members and their friends, as the hospitality of these Jersey gentlemen is known in the Eastern trade as irresistible. Cars leaving Trenton at ten o'clock brought their first cargo and from then until early afternoon the crowd steadily increased. At noon a real roast beef dinner was served, and the "chef" received praise for his work in this department.

The main event of the afternoon was a ball game between master plumbers and supply men, and the former showed their superiority when it came to tussling with the "sphere." But keen interest centered in a contest which the "IXL" Pump & Manufacturing Co., of Philadelphia, had arranged. Mr. Griffiths, of that company, was present to preside over the event. He put up a bull's-eye and then blindfolded the contestants, whose task was to mark it with a lead pencil. The first prize, consisting of a thirty dollar beer pump, went to Mr. Horketz. The second trophy, in that of a genuine "IXL" frost-proof closet, went to Charles Whitehead. An evening meal was served in the form of a buffet-luncheon, which came as a fitting finale to a most enjoyable day.

NEW ASSOCIATION OF MASTER PLUMBERS FORMED AT WASHINGTON, D. C.

A new organization of master plumbers of the District of Columbia has been formed by some of those outside the present Master Plumbers' Association, and have called themselves the Master Plumbers' Protective Association. The first meeting which was held Friday, August 23d, took place in an office in the Woodward Building, with a number of master plumbers present. Officers were elected and committees appointed to draft a constitution and by-laws, and otherwise perfect the organization, and call a later meeting. The men named to conduct the affairs of the organization for the first year are as follows: President, John J. Daly; vice-president, Joseph Whelan; treasurer, Isidore Freund; secretary, J. Carl Darnall; sergeant-at-arms, H. R. Eberly; board of directors: Chairman, Joseph Whelan; and M. Bairstow, J. T. O'Brien, Elmon J. Ewing, and M. J. Colbert.

CONTRACTS AWARDED.

Detroit, Mich.—Contract to install the plumbing and heating system in the residence of C. S. Green of Vinewood Avenue has been awarded to A. W. Schulz & Co.

San Francisco, Cal.—Contract for the heating and ventilating of the Standard Oil Co's. ten-story and basement steel cage office building, has been awarded to J. E. O'Mara, of this city.

BUSINESS VENTURES.

Fort Smith, Ark.—The Meister Brothers-Bracht Co. has been incorporated to deal in plumbing specialties and electrical supplies. The capital stock is $50,000, of which $42,050 is subscribed.

Houston, Tex.—The Kitchel Plumbing & Electric Co. is the name of a new firm recently incorporated with a capital of $10,000. The incorporators are: Joseph B. Bowles, Charles M. Kitchel and Jesse Andrews, all residents of Houston.

Among the Plumbing and Heating Contractors

NEWS FROM THE PACIFIC COAST.

San Francisco.

The action of the Interstate Commerce Commission last week in suspending the higher transcontinental freight rates which were scheduled to go into effect September 2nd is viewed with much satisfaction by local plumbing supply jobbers. By this action the new freight rate rulings, if they go into effect at all, cannot become operative until after December 31st, thus giving the local people time to study up the situation thoroughly with the idea of adapting their business to the new requirements. The general expectation here is that the railroads will reconsider certain features of the new tariff schedules and seek to make the necessary readjustments conform more equitably to the business requirements of Coast jobbers. In San Francisco the leading plumbing jobbers are planning to meet with the Chamber of Commerce and discuss this matter from every angle. Then their ideas will probably be submitted to the railroads and the Interstate Commerce Commission for final decisions. In no event is it probable that the mixed lot commodity rate, the rate recently withdrawn as a result of the vigorous protests registered against it, will be put into effect. The Coast jobbers do not desire to antagonize the railroads, but are most willing to co-operate whenever mutual interest dictates.

The San Francisco jobbers are still having great difficulty in getting soil pipe and bathtubs, especially the cheaper tubs, from the manufacturers. The stocks here are very low and some apprehension is felt that the trade cannot be promptly taken care of. Plumbing, heating and ventilating contractors are enjoying a steady normal business, but there is no great rush of work at present. It has now been definitely announced that the first buildings for the Panama-Pacific Exposition will be started within four months. While the public clamor for action on the part of the World's Fair officials has been incessant for over a year, the real need for action is not so apparent, it is claimed by Willis Polk, of the Fair architectural commission. He states that the Exposition Company will erect 33 per cent of the buildings and that these can be easily completed nine months before the Fair opens if necessary. The greatest danger of delay, he says, will be through the foreign governments in connection with their structures.

Since its organization several months ago, the Contractors and Dealers' Association of the State of California has made wonderful progress and is rapidly adding every important dealers' and contractors' association to its list of members. The chief principle of this organization is to compel members to fulfill all contracts and conform to all plans and specifications signed by them. It is not an association whose aim is to hold up anybody or take an unfair advantage, as has been intimated recently in some quarters. Local No. 2, of San Francisco, now comprises the following associations: Master Plumbers, Master Painters, Contracting Plasterers, Masons and Builders, Electrical Contractors, Master Roofers & Manufacturers, Contracting Lathers, Damp-proof Contracting Painters, and the Master Steam and Hot Water Fitters. Other local associations are about ready to join also.

A committee of the Contractors and Dealers' Association met with Mayor Rolph last week and gained his assent to the proposition of segregated contracts on all city work. It was agreed that such work should be segregated, but not to the minute extent as was formerly the case, notably in the San Francisco hospital where the number of small contracts greatly hampered the general progress of the construction work. Hereafter everything connected with one particular line will be grouped under one head. Thus the largest jobs may be carried through with not more than ten or twelve separate contracts.

M. M. O'Shaughnessy, an engineer of extensive experience and highest reputation on the Coast, has just been appointed City Engineer by the unanimous vote of the Board of Public Works. He takes the place made vacant by the resignation of Marsden Mansen, and his salary was fixed at $15,000 a year. Mr. O'Shaughnessy is 48 years of age, and was graduated from the Royal University of Dublin in 1884. He has lived in California for twenty-seven years and was the chief engineer of the Mid-Winter Fair in San Francisco in 1893 and 1894.

H. J. Henkenius, formerly of the Mark-Lally Co., is now connected with the N. O. Nelson Mfg. Co. as manager of its San Francisco branch.

The William V. Murray Engineering & Contracting Co., of San Francisco, is taking sub-figures on the plumbing and other work in connection with the construction of the new post office at Alameda, Cal.

The Pacific Fire Extinguisher Co. has been awarded the contract for the sprinkler equipment, tanks, pumps, etc. for the four-story warehouse building, owned by Kaspar Pischel, on Bluxome street, near Fifth. Amount of contract, $6,738.

The Valley Heating & Plumbing Co. has been incorporated at Eugene, Ore., by H. Sweeney, E. Sweeney and George Israelson. The capital stock is $5,000.

Lewis & Kitchen have been awarded the heating and ventilating work on the Harris County jail of Texas; amount, $16,050. Rovischung Bros. were awarded the plumbing contract at $10,417.

Coalinga, Cal.—The Coalinga Tank and Plumbing Co. has just finished installing plumbing in forty houses belonging to A. P. May of this city. William Wallace is installing plumbing in several houses owned by E. P. Plaugher, located on H. St. The Coalinga Tank & Plumbing Co. has secured the contract for remodelling the plumbing in the Coalinga Union High School. Matt Smith has the contract for installing plumbing in the residence of M. J. Buckley. The W. J. England Co. has just completed the plumbing on L. S. Stepp's residence and the Masonic Hall building on Fifth Street. Wm. Wallace is the lowest bidder for the plumbing in the Polk St. School, consideration, $2,344. W. J. England Co. has several contracts for plumbing on Pleasant St.

NEWS FROM PITTSBURGH AND VICINITY.

By the action of the Pittsburgh Master Plumbers' Association in reducing its initiation fee from $25 to $15, the officials of the organization plan to launch a far-reaching campaign for new members. This may result in the plumbing fraternity of the Beaver Valley being included in the scope of territory which the Pittsburgh Association plans to "uplift," for the work of the association is really an uplift movement. There is a possibility of the membership of the Pittsburgh organization being increased to 400 members, for there are about that many "good" plumbers in the Pittsburgh city and surrounding territory who are worth having in the organization. With this thought in mind, the local organization is starting to work to secure 50 or more new members by the year end, thus increasing the total enrollment at least twenty per cent or more.

Committees will soon be appointed locally to arrange for the entertainment and business of the Pennsylvania State Master Plumbers' Association, which is to meet in this city next April. No hotel has been selected for headquarters.

Secretary E. M. Tate, of the Pittsburgh organization, announced to "Domestic Engineering" this week that it was reasonable to believe that the local organization would arrange for a banquet this fall. The banquet last fall was a great success, and was of considerable benefit to the organization as a whole.

Large plumbing concerns in the Greater Pittsburgh district admit that they are crowded with work, while the little fellows declare that there is not much doing. A witness to this fact is the report from the office of the George H. Soffel Co., who has close to $80,000 worth of contracts on hand. The largest of these, however, is that of the Ft. Pitt Hotel, where a large addition is being completed. This contract is said to be worth close to $50,000. The additions to the Carnegie Technical Schools is another Soffel job, and it is placed at $25,000, while another contract just landed by this office is the new warehouse of the West Penn. Paper Co., who is making a big improvement to the "Point" district. The latter contract is said to be worth in the neighborhood of $6,500.

The specifications for the plumbing and heating for the new Hotel Augusta will soon be ready for the Pittsburgh plumbers, and it is likely that this job will go to a local concern, although it will attract a number of out-of-town bidders, This job, however, is the largest piece of new work that is on the boards of the architects.

Officials of the Tarentum Paper Mills Co., of Tarentum, Pa., the general offices of which are in the Second National Bank building of this city, announce that plans will be ready soon for a large addition to that plant, which is of interest to the steam fitters and plumbers. The value of this proposed contract cannot be even estimated at this time.

NEWS FROM WISCONSIN.

Racine.—This city will soon have one of the most up-to-date plumbing establishments in the state when the new home of the firm of Smollen & Schoenleben is completed. A large brick building is being erected on the property north of the new labor temple on Wisconsin Street for this purpose. The firm is enjoying a splendid business, having secured many of the largest plumbing and heating contracts in this vicinity during the past year.

Kenosha.—The work of the plumbing inspection department of this city came up for quite a discussion at a recent meeting of the common council. Chairman John Hegeman, of the sewer committee, served notice at this time that he would keep tab on the time worked by the city's inspectors and that he would refuse to allow pay save for the actual time worked. That a revision of the list of inspectors will be made in a short time is quite probable.

Washburn.—After having served the city for twenty years to heat the city building, the old boiler has been removed and a new one installed by Ed. Finnegan. The new boiler is of the latest improved type, burning all gas and smoke. It is also claimed that 50 per cent more of the fuel used goes into heat. General improvements are also being made on the entire heating system.

Appleton.—The W. S. Patterson Co. has the honor of installing the first vapor heating system in any building in this city. The merit of this system need not be dwelt upon, and, as it is rather a novelty here, much attention has been attracted. It is being installed in the fine new club house of the Appleton Elks. A special boiler has been installed in connection which allows the use of pea coal, and is equipped with a magazine which is filled once in twenty-four hours and requires no more attention.

Fond du Lac.—City Plumbing Inspector J. E. Hennen, who has been on the job since the plumbing ordinances were passed in April, 1912, has found his first case which requires the court. He found that Gustave Krueger had violated the ordinance which requires a plumbing license to make any connection with any public sewer, or lay, remove, or repair any sewer lateral in this city. It is alleged that Krueger laid a lateral to the main sewer, but had not secured the required license. The case has been continued.

Milwaukee.—The committees of the county board on the agriculture school and treasury and taxes has opened bids in connection with the construction of a septic tank at the Milwaukee County School of Agriculture and Domestic Economy. The lowest bid received was that of Adolph G. Toddy, which amounted to $1,166. This will be recommended to the board at the next meeting. The committee instructed the county clerk to advertise for bids for a temporary lighting and heating plant at the school, bids to be closed during this week.

Superior.—Louis Anderson, for the past six years connected with the local water, light and power company, has resigned and opened up a general gas fitting business with the Sanitary Plumbing Co. Mr. Anderson is a good business man, well liked by his many friends in the city, and will undoubtedly make a success of his new venture.

Chicago, Ill.—Julius Berndt, 1832 Roscoe Street, has secured the plumbing contract in the new Hugo Bork building being erected at Winnemac and Winchester Avenues.

Chicago, Ill.—Contract for the plumbing in a two story and basement store and flat building at Leland Avenue and Robey Street, C. J. Bergman, owner, has been awarded to Henry Matchen, 5072 Lincoln Avenue.

NEWS FROM ILLINOIS.

Peoria, Ill.—M. J. Kavanaugh, 204 N. Jefferson Avenue, has retired from the firm now known as the Kavanaugh Plumbing Co. Mr. Kavanaugh has been engaged in the plumbing business in this city since 1873, and has been in business for himself for the last ten years. He is a master plumber of the progressive type and was successful in the business. Though not an old man by any means, he expects to devote his time from now on to the easy side of life, and incidentally to looking after his real estate interests, of which he has considerable. The business will continue as the Kavanaugh Plumbing Co., under the management of Wm. A. Crowley and G. W. Anderson, who have been associated with the company for several years.

Peoria, Ill.—T. F. McQuellon has moved his plumbing establishment from 336 S. Jefferson Avenue, to 315 Jefferson Avenue. In his new location he has a large, well arranged display room and greatly increased facilities for handling his work. He reports business as being very good.

Peoria, Ill.—H. W. Schertz, who has been engaged in the plumbing and heating business in this city for several years as H. W. Schertz & Co., has retired from the business and will take up farming as his future occupation. He expects to go to Missouri.

NEWS FROM PHILADELPHIA.

Joseph L. Halliman, 52nd and Vine streets, will install plumbing in five new houses at Carlisle and Rockland streets and in five new houses on Market street.

Joseph Freidman & Son, 2029 S. Ninth street, have secured the contract for plumbing in thirty new houses at Fifty-third and Angora streets.

L. G. Hirst, 1226 N. Nineteenth street, will make additions and alterations to the plumbing at 1608 S. Juniper street, 1332 Bainbridge street, 1331 Kenilworth street and 2502-04 Seybert street.

Jos. Koenig, 3062 Chatham street, has the contract for additions to the plumbing at 4533-35 Cambridge street and 3321 Almond street.

W. J. Beatty, 6002 Germantown avenue, will make additions and alterations to the plumbing at 5840 Osceola street and 359 E. Rittenhouse street.

D. E. Canoe, 3528 Wharton street, has the contract for plumbing at 1247 S. Nappa street and 2525-27 Lombard street.

L. A. Deihl, 1524 Susquehanna avenue, will install plumbing at 1837-39 N. Ninth street. Also the addition and alterations to the plumbing at 3801 Lancaster avenue and 1411 Vine street.

W. W. Sutterley, 503 N. Fifty-first street, will introduce plumbing at 411-33 Van Pelt street.

H. Askovitch, 1123 S. Third street, has the contract for plumbing at 428-30 Gaskill street.

Sheets & Hebron, 39 N. Seventeenth street, have the following contracts for plumbing: 418-26 S. Camac street, 1227 Lombard street, 305 N. Sixth street, 1333-35 Bainbridge street.

Thomas McGowen, 2306 Sherwood street, has the contract for plumbing in a new building at Fiftieth and Master streets.

Morris Block, 1009 S. Sixth street, will install plumbing at 1021 S. Sixth street and 751 S. Ninth street.

U. J. Weir, 1730 Mifflin street, has the following contracts on hand for plumbing: 1329 Cleveland avenue, 1540 Capitol street, 1725 Snyder avenue, 1640 S. Clarion street.

J. G. Schreiner, 1434 Frankford avenue, will make additions and alterations to the plumbing at 245-47 E. Thompson street.

H. L. Righter, 5424 Germantown avenue, has the contract for plumbing at 5833-41 Germantown avenue.

Geo. E. M. Laughlin, 1324 Columbia avenue, will install plumbing at 3720-22 E. Thompson street.

Hugh McElwee & Son, 2029 E. Huntington street, will make additions and alterations to the plumbing at 2085 E. Adams street and 2542 Richmond street.

H. B. Clegg, 1605 Frankford avenue, will introduce

plumbing at 2535 E. Thompson street and 2538-46 Webb street.

Lancaster, Pa.—The Lancaster Plumbing & Heating Co., under the management of Fred D. Pontz, is moving its business to larger and greatly improved quarters at 228 West King street.

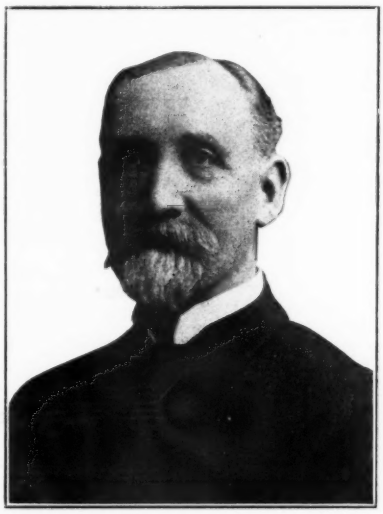
Lancaster, Pa.—The Modern Plumbing Co., is engaged with a $1,200 contract for the plumbing and heating work in J. M. Hartle's residence here.

Hanover, Pa.—D. D. Bixler's Sons have the contract for the plumbing installation in the new $100,000 residence being built here for C. N. Myers.

Cheston, Pa.—J. M. Thomas, 1816 West Third street, is engaged with the plumbing in several houses at Marcus Hook.

AMONG MICHIGAN MASTER PLUMBERS.

Grand Rapids, Mich.—Wm. Robertson, 25 Fountain Street, is one of the veteran master plumbers of the state of Michigan, having followed his chosen trade for some fifty-two years, thirty-six years of which he has been in business for himself, located for the past twenty-four years at his present address. He has a modern, neat show room



Wm. Robertson, Pioneer Master Plumber, at Grand Rapids Mich.

with an attractive office and a well systematized plumbing shop. Mr. Robertson is a student. He has spent a great deal of time and considerable money completing a fine technical library on plumbing, heating, etc. It may be of interest to our readers to know that he has on file a copy of the first issue of "Domestic Engineering" and that he has been a constant subscriber to our journal ever since it was published. He says he finds the paper not only useful and instructive for himself, but that he gives it to his employes to read and profit by. He has been a member of the Board of Examiners since 1891 and takes an active part in its affairs. Among the contracts he has on hand at the present time are: Installation of plumbing in the Schwabe bungalow, Burrock and Coyt Avenue; the heating and drainage systems in the new residence of Mrs. Julia Fletcher, and other contracts amounting in the aggregate to over $15,000.

Grand Rapids, Mich.—H. C. Birt, 27 Quigley Boulevard, has been awarded the following plumbing contracts: The Remington flats, located on Brown Avenue; the Stewart building, S. Division and Burton Streets; the Meak residence, at Jefferson & Briggs Avenue; the Drake residence, at Paris Avenue, near Wealthy Street; and ten other contracts, amounting in all to about $10,000.

Muskegon, Mich.—The J. J. Howden Co., of this city, has secured the following contracts: Installation of a vacuum heating system, plumbing fixtures and drinking fountains for the Grand Rapids & Muskegon Power Co.; a vacuum heating system in the Montague hotel at White Lake, Mich.; plumbing fixtures and drinking fountains in the Ravenna school house and the plumbing and heating systems in the Moulton Block, of this city, besides the installation of water piping in several private houses. The photograph reproduced herewith shows Fred Howden to the left and C. A. Van Zanten in the center.

Office and Showroom of the J. J. Howden Co., Muskegon, Mich.

Muskegon, Mich.—James Coyne, a local plumber, has been awarded the contract to install the plumbing and heating system in the St. Mary's Catholic church of this city.

Grand Rapids, Mich.—Contract for remodeling the plumbing and installing drinking fountains in the Pine Street school, of this city, has been awarded to Wm. O. Cargill, 252 S. Division Street, at a figure of $3,000.

Grand Rapids, Mich.—W. J. Pulte, of the Pulte Plumbing & Heating Co., reports a very prosperous season. Among the contracts they have on hand at the present time are: Installation of plumbing in the Wm. Kortlandey building, East Fulton Street, amount, $5,000; vacuum steam heating system in the new factory and office building of the Wolverine Brass

A View of A. Van Zanten's Hardware and Plumbing Establishment at Muskegon Heights, Mich.

Works, $2,500; plumbing and heating system in the Finney Street school, $2,000.

Kalamazoo, Mich.—R. C. Brenner & Co. have opened a plumbing and heating establishment in this city. They would like to receive catalogues of plumbing and heating supplies from jobbers and manufacturers.

Grand Rapids, Mich.—W. S. Dennison, of Dennison, Dykema & Co., 666 Wealthy Avenue, of this city, has just returned from a month's motoring tour through the state of New York.

NEWS FROM NEW ENGLAND.

Massachusetts.

Pittsfield.—Bids for the William L. Adams school have been received by the school board and the contracts awarded. On the plumbing, J. J. Sullivan & Co. were just $5 below the next lowest bidder and so received the contract, the price being $5,495. The heating and ventilating contract went to the Robbins-Gamwell Co., for $1,300. Bids received were as follows: Plumbing, J. J. Sullivan & Co., $5,495; W. G. Backus Sons, $5,500; Nolan & Hebert, $6,500; Noble Milne Co., $6,998; H. L. Doran & Co., $7,375. Heating and ventilating, Robbins-Gamwell Co., $1,300; D. F. Farrell & Co., $1,666.

Newburyport.—The Hub Plumbing & Heating Co. of this city was the lowest bidder for repairing the heating plant at the Jackman school but as the figures were above the amount available the contract has not yet been placed, the matter having been referred to the city council.

South Hadley Falls.—I. W. Butt, of Bardwell street, has opened a plumbing and heating establishment in South Hadley Center. Mr. Butt is an experienced man and already has several good contracts assured.

Westfield.—The contract for the plumbing work in the new post office building has been placed with W. M. and W. E. Ahern. The same firm also has the plumbing contract for the Columbus building on Elm street.

Cambridge.—J. M. Naugle has contracts for the plumbing of two six-apartment houses in Arlington and for fourteen three-apartment houses in this city in addition to several smaller contracts.

Lowell.—Contracts for the new sanitary station which the city is to erect in Paige street near the corner of Bridge street, have been let by Mayor O'Donnell and Commissioner Cummings. Patrick Conlon will do the construction work, Scott & O'Day the plumbing and Farrell & Conaton the heating. The bids for the plumbing were as follows: Charles Hanchett & Co., $3,790; Gaffney & Kerwin, $2,336; Farrell & Conaton, $2,400; John E. Drury, $2,415; Welch Brothers, $2,612; Chisholm Co., $2,750; T. Costello & Co., $3,118; Scott & O'Day, $2,238; J. T. McMahon & Co., $2,850; Carroll Brothers, $2,400; Curtin & Spillane, $3,187; H. H. Wilder & Co., $2,890; H. R. Barker Mfg. Co., $2,700.

Hopedale.—W. B. Frost, of South Framingham, has a contract to install heating in the bank block in this town.

Connecticut.

Bridgeport.—Joseph Mullins & Co. have the plumbing and heating contract for a two-apartment house which is to be erected for Peter Kehoe.

New London.—Bids for heating, plumbing and electrical work for the new city hall building have been received and the contracts awarded to the lowest bidder in each instance. The bids for heating and plumbing were as follows: Heating—Roche & McGuire, $3,806.50; Jordan & Cleary, $3,483; Newman Brothers, $3,431; Harry Kennedy, $3,315; W. H. Hopson Co., $3,030. Plumbing—Newman Brothers, $4,471; Harry Kennedy, $3,770; Jordan & Cleary, $3,421; Roche & McGuire, $3,367.55.

Wallingford.—The trustees of the Methodist church have decided to install a new heating system in the church building this fall, using steam in place of the present hot air system. The contract has not yet been placed.

Torrington.—Walter & Prudhon have the contract for plumbing and heating of a new residence for Edwin F. Mitchell, at Watertown. The E. B. Allen Co., of Litchfield, will do the plumbing and heating in the remodelled VanLear house in Litchfield.

Bridgeport.—The Bridgeport Water Heater Co. has the contract for the plumbing and heating of a new apartment house on Park Avenue for Ralph W. Barnes.

Columbus, O.—The Samuel A. Esswein Heating and Plumbing Co. has been awarded the contract for the installation of a heating plant in the school building at Canal Winchester, O.

Columbus, O.—The Columbus Heating and Ventilating Co. has been awarded the contract for the heating plant of the new school building in Huntsville, O.

GOVERNMENT CONTRACTS TO BE AWARDED.

Supervising Architect Oscar Wenderoth, Treasury Department, Washington, D. C., will receive sealed proposals as follows:

Until 3 p. m., on Oct. 7, 1912, for construction complete (including plumbing, gas piping, heating apparatus, electric conduits and wiring, interior lighting fixtures and approaches) of the United States post office at Butler, Pa. The building is one story and basement and unfinished attic, and has a ground area of approximately 6,000 square feet. First floor, only, fireproof; stone and brick facing, and tin roof.

Until 3 p. m., on Oct. 17, 1912, for the extension, remodeling, etc. (including plumbing, gas piping, heating apparatus, electric conduits and wiring system and interior lighting fixtures), of the United States post office at Lansing, Mich. The extension is about 38 by 74 feet, two stories and basement, stone faced, fireproof construction.

Until 3 p. m., on Oct. 18, 1912, for the construction (including plumbing, gas piping, heating apparatus, electric conduits and wiring, interior lighting fixtures and approaches) of the United States post office at Waukegan, Ill. The building has a basement, first story and mezzanine, and has a ground area of approximately 5,000 square feet; fireproof construction throughout, granite, marble and brick facing, and copper roof.

Until 3 p. m., on Oct. 24, 1912, for the construction, complete (including plumbing, gas piping, heating apparatus, electric conduit and wiring, and lighting fixtures), of the United States post office at Brownwood, Texas. The building is one story and basement, with a ground area of approximately 5,890 square feet. Fireproof construction; stone and stucco facing; tile roof.

All proposals should be in accordance with drawings and specifications, copies of which may be obtained from the custodians of the above sites, or from the Supervising Architect at Washington, D. C.

BUSINESS CHANGES.

Newport News, Va.—W. H. Updike has purchased G. A. Quayle's plumbing business at 232 Twenty-fifth Street in this city.

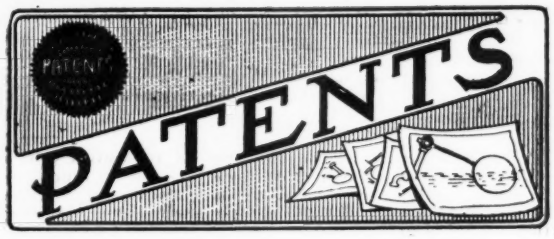
Revere, Mass.—F. H. Hussey, who has conducted a plumbing business in this city since 1877, has just moved his establishment from 158 Beach Street to 366 Broadway. He is arranging an up-to-date showroom in his new location.

Baltimore, Md.—Crook, Krier & Co. have moved to larger quarters at 218 West Saratoga street. They have an imposing list of heating contracts on their books and a few of these are: Remodeling power plant in Hotel Rennert, steam heating in the Fidelity Warehouse building, steam heating in the Mt. Vernon Cotton Duck Mills, at Woodbury, Md., and they recently completed the ventilating plant in the Belvidere Hotel in this city.

Bayshore, N. Y.—The plumbing establishment of John H. Newbury, which he has conducted in this city for many years, has been purchased by F. M. Camp, of Riverhead, N. Y.

Antioch, Cal.—Wright & Roberts have sold their plumbing business to C. S. Cunningham, of Santa Rosa, and S. Worwick, of Walnut Creek. Mr. Wright will assist the new owners in the business which will be carried on at the same location.

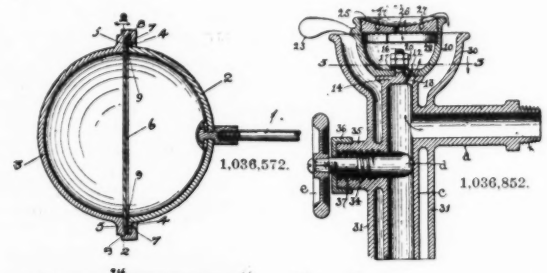
St. Louis, Mo.—Proposals for plumbing, heating, heat regulation, air washing and vacuum cleaning, in the new $700,000 Southern high school, which is to be erected at Grand Avenue and Osceola Street, were opened last week. The lowest of five bidders for the plumbing, sewering and gas fitting was the Henry Doerner Plumbing Company, $27,500. The lowest of the ten bidders on the heating and ventilating was the Modern Heating Company, $118,888. The lowest of four bidders on the air washer was the Kauffman Heating and Engineering Company, $7,583. On the heat regulation system a fizzle was scored, the lowest bidder, who bid $1,187, declaring he had meant to bid $11,087. The lowest bidder, barring this, was the Johnson Heat Regulating Company, $9,443. The lowest of three bidders on the vacuum cleaning system was the United Electric Company, $4,850.

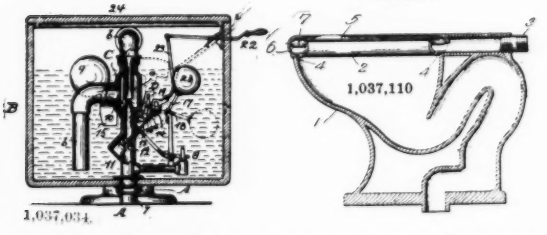


Plumbing Department.

1,036,572. Ball-Float. Louis A. Cornelius, Grand Rapids, Mich. In a ball float, a cup having a peripheral flange, a second cup having a peripheral flange of the first cup, and upset and turned over said flange, a continuous disk extending across the inside of the ball float, and held between the cups and seated in a recess in one of the cups, the diameter of said recess being less than that of the flange on the first cup, and a packing washer adapted to cover the joint between the disk and the wall of its recess.

1,036,852. Combined Drinking-Fountain and Faucet. Frank D. Jacobs, Canton, Mass. In a combined drinking fountain and faucet, in combination, an overflow pipe provided with a cup at its upper end and with a water outlet at its lower end, a pipe within the overflow pipe having a head at its upper end provided with an outlet port, and having its lower end open, a water inlet pipe extended laterally into the overflow pipe and connected with the inner pipe, a drinking cup rotatably mounted on the inner pipe, and having a port in its bottom co-operating with the port in the head of the inner pipe, said drinking cup being a smaller diameter than the overflow cup, and a valve accessible from outside of the overflow pipe and controlling the flow of water down through the inner pipe, substantially as described.

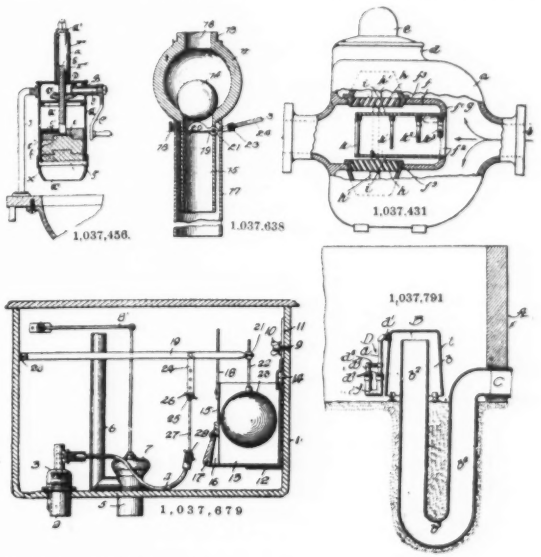




1,037,034. Closet-Flush. Henry W. Merkel, Cincinnati, O. In a closet-flush, the combination of a closet bowl and of a storage tank disposed rearwardly of the former, both being of substantially even height, an automatically controlled supply to this tank, a flush-pipe whereby the tank and the closet are in constantly open communication and which pipe with its lower end terminates near the bottom of the tank, its upper, open end being in communication with the upper part of the closet-bowl, an ejector device in communication with this flush-pipe between the ends thereof, a supply to this ejector, a valve which controls this supply, a stem on this valve, a weighted lever in operative connection with this stem, a hand-lever in operative connection with the weighted lever and whereby the same may be tilted in a manner to effect opening of the valve which controls the ejector supply and a float-controlled lever for returning the weighted lever to its normal position in which it closes the valve which controls the ejector supply.

1,037,110. Closet-Bowl. Charles W. Beswick, Tiltonsville, O. A closet-bowl having a tubular upper-edge "roll" or rim, said rim or "roll" having upper and lower water outlets the lower water-outlet delivering the water for effecting the bowl flushing or washing action, said roll also having a substantially horizontal apertured partition-member intermediate said upper and lower water outlets.

1,037,456. Soap-Supplier. Charles H. J. Dilg and Jonathan O. Fowler, jr., New York, N. Y., assignors to Granulator Soap Co., a corporation of New York. In a machine of the class described, the combination of a casing, a spindle within the casing, a crank arm to operatively turn the spindle in either direction, intermediate beveled gears between the crank arm and the spindle, a yieldable



device to continuously press toward the cutter the body to be disintegrated, retaining means to prevent the body being cut from rotating with the cutter, and a rotatable cutter connected with the spindle and adapted to operatively work in either direction whereby the body may be pushed toward the cutter with a yielding feed and the cutter may operatively engage the body when turned in either direction solely by the manipulation of the crank arm.

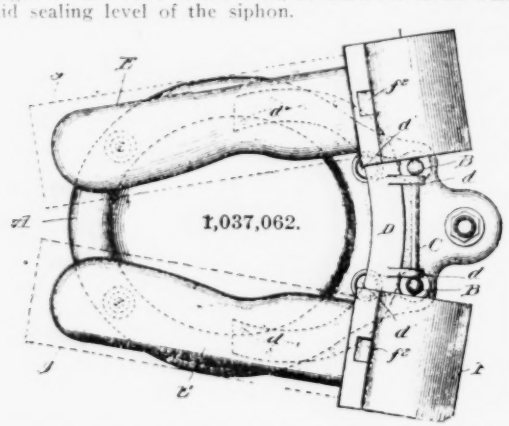
1,037,638. Ball-Cock. Edward J. Kivell, Newton, Mass. The combination with a flush tank, of an inlet pipe co-operating therewith, of a valve casing secured to said inlet pipe, a dependent outlet pipe secured to said valve casing, a ball valve operating within said valve casing, an arm pivoted to said outlet pipe adjacent to said valve casing, a semi-circular bearing projection formed on said arm adapted to engage said ball valve, a semi-circular actuating member secured to said arm, a float secured to said actuating member, an auxiliary pipe mounted for reciprocation on said outlet pipe and having slots therein for the reception of the pivot of said arm and means for retaining said auxiliary pipe in a fixed position.

1,037,431. Water-Meter. James M. Burton, Long Island City, N. Y., assignor to Neptune Meter Co., New York, N. Y., a Corporation of New Jersey. In a proportional meter, the combination of a meter shell having an inlet at one end and an outlet at the other end, a wall between the inlet and the outlet having a main flow aperture of substantially the same area as the inlet and the outlet and having also a measuring aperture, a free passage from the inlet to the measuring aperture being provided within the shell, a measuring wheel located in the measuring aperture, a sleeve extending from the main flow aperture toward the outlet, and a plurality of resistance valves hung in said sleeve.

1,037,679. Flushing Apparatus. Peter F. Snyder, Duquesne, Pa. In a flushing apparatus, the combination with a tank, a water inlet valve located within said tank, and a pivoted arm located within said tank for operating said water inlet valve, of a bracket adjustably mounted

within said tank, a hollow float having an opening therein and movably supported by said bracket and having a flap valve at the bottom thereof, and a float inclosed by said hollow float and connected to said arm and adapted to move said arm after a movement of said hollow float.

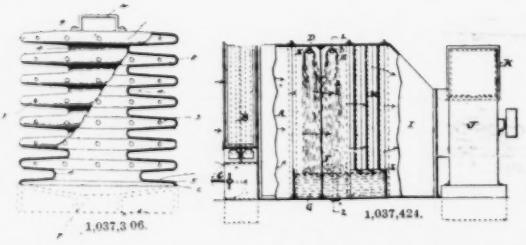
1,037,791. Adjustable Vent for Siphons. Samuel F. Miller, South Orange, N. J., assignor to Pacific Flush Tank Co., Chicago, Ill., a corporation of Illinois. In a siphon, in combination with the longer and the shorter leg thereof, of a vent adapted for determining both the sealing level and low head of the siphon embracing a U-shaped pipe having substantially upright legs, one of which is longer than the other, means connecting the longer leg of the vent with the interior of the siphon, the upper end of the shorter leg of the vent being located substantially at the sealing level of the siphon, and means for adjusting the level of the bend of said U-shaped pipe with reference to the substantially fixed level of the said shorter leg of the vent, said means being adapted for varying the low head of the siphon, determined by the height of the bend of the vent, to different levels below said sealing level of the siphon.



1,037,062. Sanitary Water-Closet. Joseph C. Seyl, Chicago, Ill. The combination with a water closet seat, comprising side members separated at their front ends, of individual paper receptacles one mounted at the rear of each of said side members and having an opening through which paper may be drawn out in line with said side members.

Heating Department.

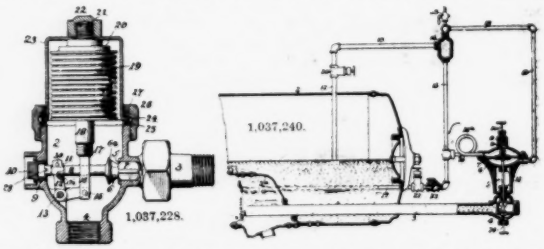
1,037,306. Heating-Drum. Charles F. Peterson, New York, N. Y. A heating drum consisting of a sheet metal cylinder having walls of sinuous vertical sections forming an inner cylindrical chamber and laterally extending annular chambers in communication therewith, said annular chambers being provided with gas outlet holes on their outer peripheries.



1,037,424. Apparatus for Purifying Air. William G. R. Braemer, Buffalo, N. Y., assignor to Warren Webster & Co., a corporation of New Jersey. In an air purifier, the combination of the chamber through which the air is passed, means to control the temperature of the incoming air, means for treating the air to a spray of water, and an eliminator composed of a series of rows of independent vertical bars, the bars of each row being staggered relatively to the bars of the next adjacent row and each consisting of front and rear surfaces arranged obliquely in opposite directions and having their junction formed with a vertical groove and also having the rear free edge of the rear oblique surface terminating in a vertical grooved portion, said grooved portions being adapted to arrest the water driven rearward over the oblique plates and convey it out of the air current.

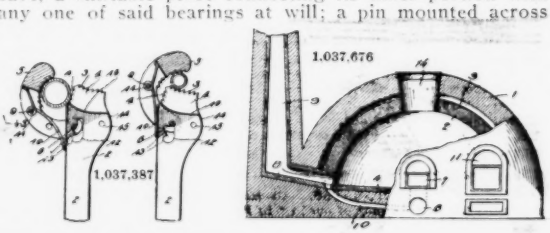
1,037,228. Steam Trap or Valve. James Logan Fitts, Merchantville, N. J., assignor to Warren Webster and Co., a corporation of New Jersey. In a device of the character described, the combination of the body having inlet and outlet ports and valve seat in connection with one of said ports, a valve for the valve seat supported so as to be freely rotatable and have means for rotating it, a bell crank pivoted within the body and having one arm operatively connected with the valve between the valve piece and the means for rotating it to move it to or from the valve seat while permitting rotation, a thermostatic member arranged within the body and consisting of an expansible chamber containing a highly expansible substance, and an extension from the thermostatic member connected with the other arm of the bell crank.

1,037,240. Boiler Feed-Water Regulator. Harold K. Gowdy, Pittsburgh, Pa. In a boiler feed regulator, a feed valve, a diaphragm to which the valve is connected, a chamber containing the diaphragm, water legs of substantially equal height communicating with said chamber at opposite sides of the diaphragm, one of said legs having a constant height of water therein to act upon the diaphragm to hold the valve open, and the other leg being normally empty, a passage connecting the other of said legs with the water space of the boiler and arranged to be sealed by the rise of water in the boiler, and auxiliary



means connected to the valve and tending to close it, and a return or discharge connection between the normally empty leg and the water space of the boiler; substantially as described.

1,037,387. Pipe-Wrench. William S. Wilkinson, Aurora, S. D. A wrench comprising a fixed jaw having a concave, toothed gripping face at one end inclined slightly outward toward the edge of the jaw, and another gripping face on its rear edge extending from the rear outer end of said first mentioned face and inclined downwardly and outwardly therefrom, said fixed jaw also having a longitudinal slot near said gripping face with spaced bearings therein arranged near the opposite side edge, and a circular bearing hole transversely spaced from said slot, and an adjustable arc-shaped movable jaw having one end slotted to embrace the fixed jaw and having its working face concave, a shiftable pivot connecting its inner portion with any one of said bearings at will; a pin mounted across



said slot of the movable jaw; and a spring, fulcrumed between its ends on said pin, and having one end bearing against the outer end wall of the slot, and the other end bearing against the rear face of the fixed jaw.

1,037,676. Garbage-Incinerating Furnace. Edward Smith, Huntington, Ind. An incinerating furnace consisting of an outer hemispherical shell having a horizontal base, an inner hemispherical lining spaced from said shell, a chimney connected to the shell and base, a hearth on said base having a central opening which communicates with an opening in the base, said chimney adjacent its base being formed with a downwardly inclined outlet.